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New Orleans Medical and Surgical Journal.

VOL. LXVIII. SEPTEMBER, 1915. No. 3

Original Articles

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REPORT ON INTRAVENOUS INJECTION OF DIPHTHERIA ANTITOXIN.

By E. M. DUPAQUIER, M. D.,

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The routine injection of diphtheria antitoxin, subcutaneously, in the service, was abandoned about a year ago, for the intramuscular injection, which became the routine injection, up to quite recently, when the intravenous administration, reserved, then, only for severe and pernicious cases (chiefly laryngeal) was adopted, as the routine, IN ALL CASES.

This progressive evolution in the method of administration was based on good reasons.

First, the subcutaneous injection. It is painful (cellulitis). Absorption is slow, less complete within 24 hours.

Second, the intramuscular injection, meaning in thigh, in mass of vastus externus. It is, by far, less painful if care is exercised to use a sufficiently long needle, and not to traumatize by a rapid

and forceful "shot." Absorption is more rapid and complete, as seen by results.

Third, the intravenous injections. It is, certainly, the least painful, and the more swiftly acting, since the neutralizing antitoxin is brought, at once, in contact with the toxins. It is certainly the most logical one.

But, on April 11, 1915, occurred adverse reactions in two cases, resulting in one death, which was ascribed, perhaps rightly, perhaps wrongly, to the method.

So, the former practice, in the service, to use intravenous injections only in late, severe cases, and in all laryngeal cases was resumed, until the discussion of the subject convinces all fair-minded practitioners that such accidents are very rare, that sudden death is liable to occur under many other circumstances and is quite a common occurrence in diphtheria, where no intravenous treatment is used. Moreover, we are inclined to believe that more data will improve our technic in the future, in order to avert such accidents.

Before proceeding any further, we submit here two tableaux with remarks:

TABLEAU I.

Showing the record of cases in the Diphtheria Ward of the Charity Hospital, New Orleans, La., injected *intravenously* with diphtheria antitoxin, from December 10, 1914, to April 11, 1915.

Type of Cases	1914 Dec.	1915 Jan.	Feb.	Mch.	April	Total
Nasal	1				1	2
Pharyngeal			6	6	2	14
Laryngeal		2	3	3	2	10
Tonsillar				4	2	6
						32

TABLEAU II.

Showing the record of *intravenous* injections of diphtheria antitoxin in diphtheria ward of the Charity Hospital of New Orleans, La., from December 10, 1914, to April 11, 1915.

	1914 Dec.	1915 Jan.	Feb.	Mch.	April	Total
Nos. of injections	1	1	9	16	8	35
Vein used—						
Median Basilic (Right)						33
Jugular						2
Accidents—Severe reaction						2
Death—Following injection						1

Of the thirty-two cases reported here, twenty-one were of a severe type. Of these twenty-one cases, eight died, seven from complications which had already set in, before admission to the

service, viz., Case II, laryngeal, being almost moribund; Case X, child having paralysis of palate, pulmonary tuberculosis and toxic nephritis.

The eighth death occurred April 11, 1915, three hours after the injection. Barring this single fatal termination, the results and symptoms observed were really most encouraging, indicating a marked advance on the former treatment. The temperature dropped to normal from 12 to 24 hours more quickly and did not rise again.

The membranes disappeared quickly as seen in six out of ten laryngeal cases, which were not intubated, recovering; and of the four intubation cases, only one died; a good showing. In all cases distressing symptoms abated sooner, markedly so. Complications developed in only one case after injection—lobular pneumonia—with recovery.

Paralysis of the palate was seen only in one case (intubation case), which recovered. Convalescence was shorter, and the feeling of well-being came back sooner, even in severe cases.

Throat was cleared from the K-L bacilli much sooner, on an average, within twenty days.

The number of carriers was lessened. In addition to these advantages we lay stress on the last and not the least fact, that the method proved a great saving of serum as compared with the intramuscular administrattion; for, most cases received only the initial dose, 10,000 units, while only in three cases was the dose repeated once.

Remember that these are hospital cases, meaning cases treated under most unfavorable conditions, with maximal virulence and minimal resistance.

We will now present the reverse aspects of the subject in reporting the case which died three hours following the injection, and we will submit some comments on the subject.

Case XXXII. Death from serum reaction. The patient, a female, eight years of age, entered the Charity Hospital at 3:30 p. m. April 11, 1915.

Family history, negative. Previous history, negative. Present illness: Child took sick two days ago with sore-throat followed by fever.

Physical examination: A whitish gray membrane found on and around both tonsils. Heart, lungs and abdomen negative. Temperature 102°. Child was immediately given 10,000 units of diphtheria antitoxin in right median basilic vein.

Two and one-half hours later, child had a chill followed by high temperature of 106°, delirium, cold and clammy skin, labored respiration. Child died half hour later.

Another case, case XXXI, a woman of 27 years, admitted on the same day, April 11, 1915, and at the same hour, treated with the same serum intravenously by the same physician who had treated in the same ward many other cases with grand results, presented also strikingly severe symptoms of reaction, just like those of this child; but in her case all symptoms had disappeared in twelve hours and she was actually well in the next twenty-four hours.

We were aware of the existence of such "striking reaction" following the intravenous injection of serum, *in some cases;* and in the beginning it was for that very reason that we were not inclined toward intravenous injections at all. But subsequently some facts have made such an impression on our mind that gradually we were more disposed to consider the matter seriously.

In the first place, during our connection with the Plague Hospital in 1914 we have seen injected into the veins of all cases, as the routine treatment of plague, large amounts of serum, as much as 200 c. c. in one instance, and in one patient four years old, without accidents. The only ill-effect noted was a slight respiratory distress due to cloudy serum, which when sedimented and decanted produced no more this symptom.

At a later date we came across reports of thousands of tetanus antitoxin injections to wounded soldiers in France, intravenous as well as subcutaneous, intramuscular, intraspinal, intraneural, intracerebral, a saturation with serum. Yet we know of but one case, reported to have shown a serum reaction, nearly but not fatal, similar to the reaction observed in our cases.

Schorer (*Jour. A. M. A.*, January 23, 1915, p. 367) reports that when the diphtheria antitoxin in his series of cases was given intravenously, four injections out of sixteen were followed in from one-half to one and a half hours by striking symptoms. These were usually ushered in by a marked chill, then an elevation of temperature from 103.2° to 104° F., and in two cases by respiratory distress. All of these symptoms disappeared in from three to twenty hours, when the patient usually felt entirely well. These immediate reactions are not grave, and in themselves did not seem to be a contra-indication to intravenous injection of diphtheria antitoxin.

And now remember the good results were remarkable. In fact, it is well known now by the Schick test that intravenous injections of diphtheria antitoxin are ten times more effective. Finally, if we consider that the number of carriers is reduced by the intravenous method, then, from the immensely important viewpoint of the eradication of diphtheria, a dream so far, we ought now to advocate the use of intravenous injections more than ever before, regardless of the risks of severe reactions.

We submit that the latter can be minimized by improving the technic.

Many of us, indeed, have come back to the intravenous injection of quinin in treating pernicious malaria, with the greatest delight, since the technic has been improved by our army surgeons especially.

The old-fashioned Bacelli solution was too concentrated and to this great concentration of the drug deaths following the intravenous injections of quinin were ascribed. The solution now recommended is of a greater dilution (1 Cm. to 150 Cm.). It is carefully and freshly made, and injected lukewarm by the gravity method. Results, since, are far greater than formerly. We know this to be a fact from actual experience in practice.

We also have obtained better results in improving our technic in the administration of the meningococcus antitoxin after the present technic of the intravenous administration of quinine.

We suggest, first, that the serum for intravenous injection be made of a greater dilution, if possible a high dilution of dry globulins, not a concentrated solution, and clear, not cloudy.

Second, that it be warmed and administered at the temperature of the body, not heated to 60° C., for antitoxin is an enzymoid p. 138, Chimie Physiologique de Arthus).

Third, that the gravity method and not the hand-syringe—"push-method"—be used. Of course there is always an unknown, inaccessible individual element that may, in our cases, show adverse reaction in spite of the best technic. This is unfortunate, just as it is in other instances, where very active therapeutic measures must be used. But the method itself, for these few exceptions, cannot be discarded in the light of its great advantages.

One point, we believe, is most essential. It is that the injection should not be made at once, in those entering the hospital

walking, or after exertions of some kind, as in the two instances we reported here. Rest, a rest of at least one hour in bed, except in severe laryngeal cases of emergency, should be observed before the serum is injected into the veins; of course, with all the precautions of asepsis and the details of some improved technic such as the one mentioned above, we are now following in private work since the mishap reported here.

In conclusion we believe that the striking serum reactions are not a contra-indication to the intravenous administration of diphtheria antitoxin, and that when the technic is perfected the intravenous administration of antitoxin will be the routine method of treating diphtheria. The following letter, published here, relates to the subject:

Dr. E. M. Dupaquier,

Medical Bldg., New Orleans, La.

Dear Doctor: Our New Orleans Branch has forwarded to us your letter of May 17 referring to the work which you contemplate carrying out in connection with the use of diluted antitoxin by the intravenous method. We note particularly your inquiry as to the feasibility of utilizing our dry Antidiphtheric Globulins for this purpose. As regards the potency of the dried product, we may state that it is much more stable than in the liquid form. We have tested out globulins after five or six years and found practically no loss in antitoxic strength. The solubility has not, however, been so satisfactory and this in our opinion is the chief objection to utilizing the dried globulins for your experimental work. We may say that with all of these desiccated serum products we find a certain amount of irregularity in regard to solubility. One lot will be freely soluble and with the next considerable trouble will be experienced. The chief objection is that this difficulty in obtaining a solution is not apparent at the time the product is first made and develops under market conditions, so that, even though we carefully test out the product before it is sent out of the laboratory, difficulty in dissolving it may be experienced some time later.

May we ask whether there would be any particular advantage in using the dried serum for this purpose? Why could not the liquid globulins be diluted advantageously? It would seem to be less trouble and then no question as to solubility could arise.

We are very much interested in the line of work which you are carrying out and shall be glad to have your further advices.

Very truly yours,

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THE COMBINED APPLICATION OF THE PERCY CAUTERIZATION AND INTERNAL ILIAC LIGATION, IN THE TREATMENT OF CERVICAL CANCER.*

By MAURICE J. GELPI, A. B., M. D.,

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The present plan of treatment of cervical cancer has come as a gradual evolution. From the beginning, in early operable cases, total extirpation of course has always been advocated. For the advanced cases, when they were treated at all, they were at first simply singed with the Paquelin cautery. To the Paquelin cauterization was sometimes added the application of fifty per cent zinc chlorid paste, and this was in turn superseded by thorough cauterization with the solid copper soldering irons. Some of these cases were afterward treated with the X-ray. In 1913, I treated a number of cases with intravenous infusions of colloidal copper. While we were still struggling to find something to produce definite results in these cancer cases, Percy, of Galesburg, Illinois, presented his elaborate, clean-cut technic for cauterization. Following the adoption of this attractive procedure, Proust and Maurer, of Paris, suggested internal iliac ligation as an immediate preliminary step to the Wertheim panhysterectomy. This suggestion was also adopted, and combined with the Percy cauterization; but the ligation and burning were done in all cases. The credit for combining these two valuable procedures and of applying them in the treatment of all cervical cancers, belongs to my own friend and chief, Dr. S. M. D. Clark, of New Orleans.

PLAN OF TREATMENT.

1. The present plan is to use the combined burning and ligation, even in the frankly operable cases. In these cases, the burning and ligation are simply done as a distant preliminary step to the Wertheim total extirpation. In rare instances it may be done as an immediate preliminary step. The objects aimed at are: Actual destruction of cancer cells from below, thereby diminishing chances for grafting during extirpation; checking hemorrhage; affording opportunity for exploration of parametrium, deep pelvic and juxta aortic glands at the time of ligation; preventing annoying venous bleeding during extirpation, by pre-

*Read at the Attakapas Clinical Society Meeting, April 6, 1915. Paper intended to be accompanied by lantern slides illustrating details of technic.

liminary arterial ligation; producing a local shrinkage of the cancer mass; improving the patient's general condition, and altogether making the case a better surgical risk.

2. In borderline cases, ligation and cauterization are done with the objects enumerated above, plus that of conversion to the operable class.

3. In those extensive cases where the mobility of the uterus is impaired by invasion of the parametrial tissue and the vaginal vault, both ligation and cauterization are done from the beginning. Occasionally when an exuberant mass protrudes into the vagina, it may be necessary to limit the first sitting to cauterization, without opening the abdomen. In three weeks or less at times the combined technic may be applied.

4. In the class of cases involving the bladder and rectum, especially if accompanied by marked cachexia, no attempt is made to do anything.

Summarizing the plan of treatment then, in early cases, under ether, get a frozen section for absolute diagnosis. Then tie the iliacs and one ovarian, burn from below, and in two or three weeks do the Wertheim panhysterectomy. In borderline cases get a frozen section, ligate and cauterize. Repeat the Percy cauterization as often as necessary at intervals of about three weeks. If the case should become operable, Wertheim hysterectomy is indicated. In more advanced cases follow the same plan, repeating the cauterization four or five times if necessary. These cases offer little hope for total extirpation as a rule, but we have noticed remarkable improvement in some of them, and even if they fail to become operable, we look for a distinct prolongation of life and possibly, at times, according to Percy, actual cure, without extirpation. In the cases with bladder and rectal involvement, nothing is attempted.

RATIONALE OF COMBINED METHOD OF TREATMENT.

The question as to the underlying basis for the plan of treatment adocated is easily explained.

By the cautery at over 112 degrees F. applied for twenty minutes, we cause an actual death of cancer cells. It takes about 130 degrees or over to kill normal tissue cells. The heat is transmitted from cell to cell in all directions for from one to two inches or more. Furthermore, this degree of heat has a tendency to produce a thrombosis which in turn causes a starvation of cancer

cells. So that we accomplish by the cautery two things, immediate cancer cell death and subsequent cancer cell starvation.

What now do we accomplish by internal iliac ligation?

In considering this point it must be remembered that we ligate both the internal iliacs, also one ovarian, making a total of twenty-five arterial trunks, including the vaginals and uterines. So that the bulk of the pelvic circulation is remarkably impaired at once. Here again we have starvation as a result. The ligation also prevents the possibility of secondary hemorrhage from sloughing uterines and affords the opportunity of examining or excising for examination any retro-peritoneal glands that might be present. Summing up, we have starvation and immediate cell death produced by the cautery applied from below, and from the abdominal side we have starvation prophylaxis against hemorrhage, and opportunity to explore or extirpate glands. If later radical hysterectomy is done, we have, in addition, considerably less venous bleeding at the time of operation.

IMPORTANT DETAILS IN TECHNIC.

The following points are important in the application of the method:

1. The irons should not be hot enough to carbonize the tissues, as this prevents dissemination of heat.
2. There should be no excision of tissue during cauterization except in rare instances when a large fungating mass fills most of the vagina. This excision when done should be accomplished with the cautery.
3. The vagina must be protected by a water jacket to prevent subsequent atresia.
4. The heat must be controlled from the abdominal side.
5. In tying the iliacs the ligature must be applied close to the bifurcation (about two-thirds of an inch), so as not to miss any branches, especially the vaginals.
6. Care must be taken not to injure or tie the ureters.
7. Both ovarian vessels must not be injured, as in the case of bilateral injury of these requiring ligature, only one internal iliac can be ligated.

RESULTS.

As to the question of absolute cures, we have nothing to say for the present. No mention whatever can be made on the subject until the five year limit has expired. However, the results

up to now have proven surprisingly encouraging in spite of the fact that occasionally we have seen cases develop vesico-vaginal and recto-vaginal fistulæ. We have had a death from peritonitis and one from hemorrhage, though the latter occurred before the routine ligation of the iliacs was adopted. Remember, though, in considering this dark side of the picture, that the bulk of our cases were taken from among those that no one else would touch under any circumstances. They belonged to the class of patients who are given a box of morphin tablets and told to go home and die. Yet from this mass of derelicts we have cases that were transformed to such an extent that total extirpation could be accomplished and they are now apparently free from cancer. In one of these cases a number of sections was made from the parametrium and vaginal vault, and no carcinoma could be demonstrated microscopically. We have other cases that have been so much improved that we have the greatest hope for an early total extirpation and possibly a radical cure. We have still a number of cases whose life has been unquestionably prolonged, who are at present living quite comfortably, though we expected when we began treatment last summer that their time would have expired many months ago.

In conclusion I would say that my main reason for presenting this plan of treatment to you is that, up to the present time, it has given us, without a doubt, the best results, and the greatest promise for the future.

THE EMETINE ERROR.

By JULES J. SARRAZIN, D. D. S., New Orleans, La.

During the latter part of August, or the beginning of September, 1914, without reference to the previous labors of Chiavaro, Barrett and Smith, in the same field, the New Orleans morning and afternoon papers were aglow with a specific treatment for Riggs' Disease based on amebic etiology, promising magic results. Some weight to this rosy outlook was given by interviews with reporters which were published. A first impulse was to hold back judgment, expecting such public newspaper talks to be disclaimed as not being authorized, even though the amebic etiology and treatment were affirmed, which at that time seemed rather doubtful on the lines of utter disregard for infected cementum and

carious bone then set forth. However, on September 14, 1914, at a meeting of the Orleans Parish Medical Society, the amebic etiology and therapy were brought out on lines quite identical with the above mentioned newspaper articles.

Not having yet made any tests, but being strongly impressed by the well known systemic factors and local etiology of Riggs' Disease, believing that a sincere but dangerous error was being promulgated, I then limited myself to pointing to it in broad terms, cautioning against a blind and free use of the treatment before its value was established.

On October 26, again at a meeting of the Orleans Parish Medical Society, the emetine-ipecac treatment was presented, based on some two hundred cases successfully treated, the *Ameba buccalis* being the criminal, its ingress being explained in most cases by toothpick injuries to gingival tissue. I fully agreed that the deleterious results following toothpick traumatism rendered it an undesirable instrument in usual mouth conditions, but I also pointed out that the toothpick amebic etiology was unnecessary to Riggs' Disease, because inspissated mucus on teeth necks, charged with dead epithelial cells and infectious bacteria, furnished the local part of the etiology by themselves, aggravated by irritation from lime salt deposits when present, while the resistance of tissues was lowered by the usual dystrophic atrophy of the human maxillary and mandibular structures. I had by that time been testing the emetine-ipecac treatment, and stated my results. Tumefied, bleedy gums, in habitually neglected mouths had markedly improved as a result of removing salivary calculi and brushing away a part of the septic films off teeth necks. Results from mouth hygiene are generous beyond the proportion of its thoroughness, although perfect results come from perfect technic only. Fluid extract of ipecac, or even plain water, would benefit tissues habitually infected by filth; the patient's attention having been drawn to mouth cleansing, it being done a little more and better than usual. I also reported at the same time that in no case of loose teeth, or suppurating pockets, or carious alveoli, had I seen any objective improvement from the ipecac-emetine treatment. Discomfort to patients from such teeth usually lessens as any treatment is instituted. This implies no real change of conditions, and, as time demonstrates, no cure. Of course, I had abstained from any systemic measure other than emetine hy-

podermics, and locally from going beyond the removal of chunky deposits off roots. I was testing the amebic-emetine-ipecac treatment clinically. In some of those cases hypodermics of emetine had been given for six consecutive days, followed by weekly injections, doses ranging from 2-3 gr. to 1 gr., while ipecac was irrigated in fundi of all pockets and used on the tooth brush, with no real improvement in over five weeks.

On October 23, at a meeting of the 1st and 2nd Districts of the Louisiana State Dental Society, the amebic theory merged with the infective mucus film etiology I had mentioned two days earlier, instead of the amebæ being considered independently. Since amebæ feed off the protein molecule broken up by infectious bacteria, it was unquestionably proper to locate them in inspissated mucus films which supply the true etiology of Riggs' Disease. Bacteriologists are generally agreed that *Amebae buccalis* have no pathological significance, and feed as just mentioned, while, on the other hand, the *Ameba histolytica* of Schaudinn and Craig, and the *A. tetragena* of Hartmann and Vierick are tissue burrowers. Actual penetration deep into tissues should not be confused with compression between diseased cells at the surface or fundi of pyorrheal lesions, which are being disintegrated as they succumb to infection, and between which a microscopic protoplasmic mass will readily imbed itself.

The amebic etiology has just recently gone into still another phase, making the *Ameba buccalis* the carrier of pathogenic germs into the walls of alveolar pockets. Since laboratory experiments upon autolized tissue, amebæ in symbiosis with infectious bacteria, show the former throwing off the latter after feeding on the protein molecule freed by them, it is quite devoid of any surprise that pathogenic bacteria should be present on *Ameba buccalis*. For a few infectious bacteria thus located, there would be myriads of them independently diseasing soft tissues, the leukocytes of which are neither numerous nor active enough to destroy them as rapidly as they gain entrance. If we bore in mind that Riggs' Disease requires two causes to produce its suppurative stage, we would be less easily disturbed by any unproven etiology ascribed to it. The dystrophic atrophy of alveolar tissues, due as much to the fact that arterial blood must be pumped upwards to them as to their being transitory structures, explains why the suppurative process easily results from adjacent infectious cervical films or

deposits. We there have the predisposing, or less resistant, systemic condition, and the determining factor. Under favorable conditions the latter is resisted by the former. Again, in the absence of local infection, but with destruction of alveoli due to insufficient blood nourishment, teeth sometimes become lost from lack of support. With these facts in view, any restricted local etiology becomes puerile.

Dr. Anna Williams of the Park Laboratory of the New York Board of Health has just been conducting a series of tests where *Amebæ buccalis* have been found in school children's mouths, as follows:

Healthy gums 30%
Healthy gums with carious teeth.....50%
Calculi and receding gums.....84%
Tumefied, bleedy gums.....94%

Amebæ are so widely distributed in nature that no surprise need result. As we are not wont to expect Riggs' Disease in the mouths of children, these investigations rather point to the increased presence of amebæ in more luscious pasture grounds, as a result of favorable conditions for their nourishment, but not as a cause of disease.

There is here no intention to question the destruction of *Ameba buccalis* by emetine or ipecac. This is quite beyond doubt. On the other hand, there is strong reason to believe that these amebæ are unjustly accused of producing conditions they only enjoy, that the health of innocent victims is being threatened by strepto- and staphylococci allowed to carry on infection while amebacides constitute treatment. Unquestionably, it would seem desirable to sound that warning as loudly in the public's ear as was the sincere but misleading theory of amebic etiology. It would be far better for some teeth to be speedily sacrificed than to jeopardize health by maintaining dangerous foci of infection.

All the successive negative amebic treatment results which I have seen have for some time convinced me that the amebic etiology belongs to that large class of theories which may only be applied with caution before conclusive tests are made, and I regret it sincerely, first, because I have faith in the sincerity of the men who have devoted great energy and time to these original researches, and second, because hope for a rapid and easy cure seems blasted, which would have been a boon to humanity. Alone, one test could outweigh painstaking, thorough, clinical evidence based

on intimate knowledge of Riggs' Disease pathology. This would be the production of the suppurative disease in the mouth of a fairly healthy subject affected with superficial gingivitis, dental chair and home oral prophylaxis being perfectly carried out, while, following the latter nightly, at bedtime, gingival margins would be generously smeared with a pure culture of *Ameba buccalis*. Such a test would carry weight if conducted with flawless details. Considering that cultures of amebæ on autolized tissue are not infrequent laboratory technic, such cultures should be accessible.

Whenever iodin is painted on gums, or any germicidal solution used thereon, or in pockets, other than emetine or ipecac, a reliable factor is brought in the treatment which destroys micro-organisms other than amebæ, producing results due to reaching the correct etiology of the disease. Improved conditions resulting should not then be credited to the emetine-ipecac treatment. A mouth wash containing iodin will also be similarly misleading if used in connection with the amebic treatment. Likewise, the so-called "planeing" of roots removes material infected by germs other than amebæ, and must also be avoided in testing the merits of the emetine treatment.

A factor which sometimes misleads experimentation with emetine hydrochlorid is that it is mildly germicidal to pathogenic germs such as strepto- and staphylococci, and it is hemostatic.

Since the "End"-*Amebæ buccalis* do not carry infectious germs far beyond necrotic areas, but are present in the disintegrating walls and at the fundi of pockets filled with pus, and bounded by carious bone and infected cementum, it is reasonable to deduct that emetine hypodermics, or ipecac per os, while they destroy amebæ, and may serve to lessen the danger of systemic infection, play little part in inhibiting micro-organic growth inside Riggs' pockets, where, of course, no blood circulates. Quite similarly, vaccins may exert a favorable influence on systemic morbid manifestations resulting from infection by germs identical with those composing the vaccin but, owing to the fact that no blood circulates through the pockets of suppurative Riggs' Disease, it is idle to expect that either these pockets themselves, or their contents, may be affected by such hypodermic injections. It is what is done locally and directly into the pockets themselves, which is the beneficial procedure in both instances. Therefore, irrigating pyorrheal pockets with emetine or ipecac, owing to a weak germicidal action, will lessen, without completely checking the pus exudate in chronic

cases. This diminution is more marked after irrigating pockets for the first time than at any subsequent repetition, simply because pus does not accumulate as thickly in such lesions, in twenty-four or forty-eight hours, as in the preceding months during which treatment was either completely omitted or done haphazardly. In other words, due to far greater germicidal power to truly pathogenic micro-organisms, if a solution of iodin crystals had been substituted for topical use, the control of suppuration would have been far greater, although not complete without the removal of local infectious and irritating factors, backed by adequate measures where indicated.

Again, it may be easily understood why results misleading and deceptive to the casual, inexperienced, or superficial observer of Riggs' Disease conditions, may occur, in the acute stages, under emetine-ipecac treatment, before old chronic pus pockets have existed. There yet being no such pus pockets on roots, the topical use of ipecac inhibits the surface growth of strepto- and staphylococci, while blood hypodermically charged with emetine protects the gums it permeates. Add the hemostatic action of emetine and the usual fact of more and better mouth hygiene having just been instituted, and gingival conditions would inevitably improve before the formation of pus pockets.

The local role played in the production of Riggs' Disease by inspissated mucus, bacterial, cervical plaques is so plain to students of that etiology (the adjacent tissues succumbing to that infection), frequently coupled as it is with irritation from hard deposits, and habitually in the presence of dystrophic tissue atrophy, that it seems puerile to trained Riggs' observers to conjure innocent non-pathogenic amebæ to cause lesions they only inhabit to feed therein, and the pathology of which does not suggest their concurrence.

Since it has recently become common routine medical practice to treat Riggs' Disease hypodermically, or by mouth only, it would behoove the dentist as well to announce a specific treatment for a systematic disease, the phases of, and therapy for which he knows not, except from hearsay of medical practitioners with limited special experience therewith, and to then loudly herald his new system of treatment before its being thoroughly tested in professional circles. Results from such well meaning errors are rendered harmful in proportion to the weight of authority which sincerely promulgates them, countless healths and lives being

threatened by septic oral conditions, which should have been corrected; in many cases extraction being far preferable to their continuance. The gravity of the situation is increased by local directions for mouth hygiene being given by some physicians in connection with the new specific emetine treatment, which disregard the fundamental etiology of infectious bacterial plaques on proximal teeth necks, advising brushing teeth without stimulating gingival circulation, and without even passing floss between them. Indeed, there would be vastly more oral prophylaxis in discarding the tooth brush entirely, but insisting instead on thoroughly rubbing a minute flat tape on all proximal teeth faces and necks, mesial and distal, and employing a clean rag to break up thickened mucus films on all exposed dental surfaces, even though gingival stimulation, along with other well established and proven oral prophylactic measures, which rest on the combined experience of experts in that line, was discarded by medical men in assuming the role of mouth hygienists. Discarding the tooth brush might even appeal to a few sensational dentists who accuse it of being a carrier of infection. Of course, if ten or one hundred surgically clean brushes sweep in as many filthy, septic mouths, and later, after a thorough rinsing in cold water and drying (which inhibit bacterial growth), are used to inoculate culture tubes, an abundant growth of pathogenic germs must surely result. Conclusions drawn from such a procedure are strikingly unscientific because they take no account of the fact that vastly more infectious material will have been removed from the mouth than can possibly be left in the brush, because they do not duplicate conditions which obtain when truly germicidal dentifrices are employed, and because, even as mouth infection is reduced by repeated brushings, it will continue to remain so far in excess of that in the brush as to render the latter insignificant.

The experience of Dr. Eugene S. Talbot with strong solutions of iodin in oral therapy at once sets at rest the claim that germicides may not be employed on the oral mucosa which are capable of destroying infectious bacteria in the mouth. Dentists who entertain a sentimental or sensational fear of the tooth brush would act more wisely by advising its immersion in an aqueous solution of iodin, followed by rinsing, after each mouth cleansing, than by misleading the laity, decrying the brush without offering a real substitute for it.

The paramount importance of patients constantly breaking up

and removing infectious inspissated mucus films from all faces of teeth necks, and developing a highly polished surface thereat, especially mesially and distally, where septic deposits are otherwise left undisturbed, is easily realized by considering that infection otherwise causes the time honored pathological stages of congestion, inflammation and suppuration, wherever tissue resistance is lacking, as is usually the case in gingival ones.

Neither the proper, root to biting surface, brush motion, nor an efficient polisher carried by it dry, have ever injured tooth structure. It is the improper crosswise motion of bristles which wears transverse cervical grooves and irritates gingival margins, quite regardless of the dentrifice employed, unless it be gritty beyond reason. Bristles and water, or soap, and chalky impalpable dentrifices, are unable to completely remove septic films from and develop the protecting polish on exposed surfaces of teeth, while a waxed thread or tape is similarly inefficient in comparison with positive polishing powder applied by suitable agents in both instances. It has been proven that five years' daily polishing of natural teeth with finely pulverized pumice stone resulted in perfect, lustrous dental surfaces.

As to the "End"-*Ameba buccalis*, it is perfectly in accord with natural law that they should be feeding in the bacterial plaques mentioned, that they should pass on to recesses in gingival margins, as invaded and diseased, and that, as peridental tissues break down in the above described etiological and pathological processes, they should occupy the fundi of pockets, where a more favorable pasture invites them: stagnant pus cells, not red blood corpuscles. Like ducks, they should migrate to more favorable feeding grounds; but not as fast. They are unquestionably apt to be present, but not accountable as pathological factors. Etiology and clinic both thus point.

PELLAGRA IN THE UNITED STATES.

By E. M. PERDUE, M. D., D. P. H.,
Professor of Tropical Medicine, Eclectic Medical University, Kansas City, Missouri.

This article has been prepared as an especial appeal to the physicians of the South. Because of the conditions herein referred to, the physicians of the South are called upon to combat this disease. Pellagra has gone unchecked long enough. Unless it receives proper attention, from the very nature of things, especially

from conditions peculiar to the South, it is bound to increase. Under these conditions it is a menace to the health and the economic progress of this rich portion of our country. Therefore it is high time that we recognize that we have had a surfeit of the so-called scientific research based upon impossible hypotheses. Too much time has been lost and worse than wasted on the corn theory, the "buffalo gnat" theory, the fly theory, the proteid diet theory. Too many hypotheses have been the bases of years of useless work. Let us look at the condition about us. Let us not overlook the obvious any longer.

To a trained epidemiologist, pellagra is a chronic intoxication. To a physician who knows anything about the human tongue it is an acidosis. These two facts eliminate parasitology, bacteriology, transmissibility, infection and heredity. If a patient who works in a lead furnace comes to one of you with blue gums, loose teeth, wrist drop and colic, you do not look for bacteria or talk learnedly of serum treatment. If he has been overdosed with mercury and is salivated you do not give him thymol for worms. If he be an habitue of alcohol, opium or morphin he is the victim of a chronic intoxication. So is the pellagrin.

Pellagra is very prevalent in Roumania. Some 50,000 to 75,000 people in that country are its victims. Italy has 100,000 pellagrins. It is not a far fetched conclusion that there ought to be a common factor between the prevalence of pellagra in Roumania and Italy and its prevalence in Virginia, North and South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas, Tennessee, Kentucky and Missouri, and the lesser prevalence in the New England States, in Michigan, Illinois, Indiana and California. In all these countries it is a disease of domestic animals as well as man. The dogs, cats and cattle have pellagra in Italy. They also have it in the United States. Why is pellagra scarcer in Michigan, Indiana, Illinois and Kansas than in South Carolina or Georgia? Why is there little or no pellagra in North and South Dakota, Montana, Idaho, Wyoming, Utah, Colorado, New Mexico and Arizona? Why is there no pellagra in northern Oklahoma while it is very prevalent in southern Oklahoma south of the Wichita and Arbuckle mountains? Why are Nebraska, Kansas, Illinois, Iowa, Eastern Colorado and Northern Oklahoma and many other regions prairie land? Why do pellagrous regions have "piney woods," chestnut, beech and sugar

maple? Why are the "black lands" of Texas prairie? Why is the area of the "Selma Chalk' of Alabama prairie? Why is there no pellagra in regions of the South where the water is "limestone" water or "hard' water? Why is pellagra strictly localized and contracted in the South and in other regions for that matter, where the water commonly drunk by the people is "freestone" water or "soft" water? Why does the map of the geographical distribution of pellagra absolutely coincide with the map of the geological distribution of clay soils? Why is pellagra on the increase? There can be but one answer to all of this, and therein lies the cause, the prevention and cure of pellagra.

Pellagra is a chronic intoxication due to colloidal silica in solution or suspension in drinking water.

Pellagra is strictly localized and contracted in those regions where the water commonly drunk by the people is derived from or is in contact with clay.

A large portion of the hill country and the plains of Roumania is clay derived from the disintegration of the igneous and crystallines rocks of the Carpathian Mountains. The Italian peninsula is covered with clay derived from the disintegration of the granites, feldspars, gneiss and serpentine of the Alps and Appennines. The small proportion of alkalies originally in these minerals has been dissolved out and long since contributed to the salts of the Black Sea and the Mediterranean.

In North America the Appalachian System, the Height of Land, the Ozark and Boston Mountains in Missouri and Arkansas, the Arbuckle and Wichita Mountains in Oklahoma, and their continuation in the highlands of Texas, are the oldest land formations. The slopes toward the ocean and the gulf have been leached by the rainfall of geologic ages. Since the Colonial Period they have been progressively denuded so that their alkalies and organic humus are gone. Their soils are red and yellow clays. A large part of the Mississippi Valley was once an inland sea. It contains its alkalies. It has large areas of limestones. Its water supplies are hard. Its soils contain alkalies. They are largely dark in color, do not support pine forests, are covered with prairie grass in the primitive state. To the north is an area scarred by glaciation. It is covered with several feet of glacial drift derived from the granites of the north. This surface soil is also acid, but it has a substratum of limestones. Part of it supports pine forests.

Acidity and alkalinity are so intimately associated that there is very little pellagra in this region. The Missouri River crosses great alkali plains. Its waters are hard. The cities which take their water supplies from the Missouri River have no pellagra. The Arkansas River flows from Colorado through the great alkaline plains of Kansas and Oklahoma. Its waters are hard. It flows into the pellagrous regions of Arkansas. The city of Little Rock, in the very heart of the pellagrous region, takes its water supply from the Arkansas River. The people who habitually use the city water do not have pellagra. The people who use well and spring water have pellagra.

The writer is a sanitary and chemical engineer as well as an epidemiologist. As I write I have before me a report on the clays of Georgia and the other reports of the Georgia Geological Survey on the Granites of Georgia and the Geology of the Coastal Plain. I have read Bulletin No. 2, "The Clays of Mississippi," a "Preliminary Report on the Clays of South Carolina," "Clay Deposits and Clay Industry in North Carolina" and the underground water supplies of Alabama, Georgia, Mississippi, Florida, North Carolina and Virginia. I have also a complete file of the reports of the State Geological Surveys of Alabama, Georgia, Tennessee, North Carolina and Virginia. The geology of all these states is very similar. There is the mountain region in the west of the northern members and in the northern part of the southern members. Toward the Atlantic ocean is the Piedmont Plateau which extends from the mountains to the Coastal Plain. The boundary between the Piedmont Plateau and the Coastal Plain is the "Fall Line" which extends from Columbus, Georgia, to Augusta, Georgia, and on north in a curve conforming to the general trend of the mountains and coast line, crossing the James River at Richmond and the Potomac at Georgetown. The Piedmont Plateau is covered with residual clays formed from the weathering and disintegration of the igneous and crystalline rocks of which the plateau is composed. The Coastal Plain is formed by sedimentary clays which have been washed down from the Piedmont Plateau. In Alabama and northeastern Mississippi the southwest end of the Piedmont Plateau is called the Ashland Plateau. Its soils and the soils of the Gulf Coastal Plain are practically the same as those of the Atlantic Coast States. The Piedmont Plateau is not so prominent in states north of Virginia

as the mountains come so much nearer to the coast. However, the clays are responsible for the pellagra of the New England States.

All these conditions have been thoroughly worked out by the United States Geological Survey, the State Geological Surveys, and the Bureau of Soils of the Department of Agriculture. No essential fact in the epidemiology of pellagra is lacking. The Bureau of Soils has mapped almost all of the pellagrous region so carefully and on so large a scale that the country roads and farm houses are indicated. The soil maps of counties in the southern states are as large as a common table top. More surveys have been made in the southern states than in any other area. The water supply papers of the United States Geological Survey are replete with information as to the high silica content of the surface waters of this region. The Superior Analyses of Igneous and Crystalline Rocks of the United States Geological Survey leave nothing for the student of pellagra to do. It has been determined that samples of soils of pellagrous regions when prepared and dried do not effervesce when treated with hydrochloric acid, evidencing the absence of lime, and that solutions of such soils turn blue litmus paper red, evidencing their acid character. The Thompson-McFadden Pellagra Commission of the New York Post Graduate Medical School and Hospital spent three years and a large appropriation at Spartanburg, South Carolina, in the study of pellagra. They visited the pellagrous families, studied the economic conditions of the farm and urban population, paid especial attention to the conditions of life, housing, conditions of labor and the food supply of the "mill villages," divided the population into classes, sexes, races, etc. They studied the flies, mosquitos and buffalo gnats. They state in one of their reports that they did not study the water supply because it had nothing to do with pellagra! Ten years before the Thompson-McFadden Pellagra Commission went to Spartanburg Co., South Carolina, the Bureau of Soils of the United States Department of Agriculture, in a very carefully prepared monograph with a large and excellent map had set out in full the cause of pellagra in Spartanburg County, South Carolina. It is set out in the Soil Survey of the Campobella Area, Bureau of Soils, Washington, D. C. In face of all this the United States Public Service and these very

learned (?) commissions go on deceiving the profession and the public as to the cause of pellagra.

The State Board of Health of Tennessee through its Pellagra Commission distributes a map of the geographical distribution of pellagra in Tennessee. This map coincides with the geological distribution of clays in Tennessee. The western Tennessee region between the Tennessee and Mississippi rivers is alike famous for pellagra and the brick and tile industry. The writer has received letters from physicians all over the South concerning pellagra. They all come from the clay regions.

The constant drinking of water containing colloidal silica in solution or suspension results in the storing of salts in the tissues, abstracting water from the tissues and setting acids, especially hydrochloric acid, free. The abstraction of water results in a drying of the tissues, the disappearance of fat, the drying and wrinkling of the skin. The serous fluids dry up, the digestive fluids are lacking. The body loses weight. The nervous system exhibits the symptoms of drying or abstraction of water, first hyperesthesia, followed by paralysis. The acidosis is evidenced in the digestive disturbances, the burning, the tongue and the classical gauntlet and mask made worse by heat. The classical triad of cutaneous manifestations, digestive disturbances and nervous disturbances are identical with silica intoxication.

Now the specific cause of pellagra being known to be a mild acidosis caused by an acid of slow absorption, the rational treatment is the simplest antidote of this acid. It is well known that silica is found in colloidal solution only in the acid condition. In chemical analyses of the clays it is put in evidence by rendering the solution acid with hydrochloric acid. It is also well known that it is neutralized by alkalinity. The general prevention of pellagra, therefore, is the simplest alkalinity, the common, simple alkali with which silica is so commonly associated in the ground. It is not necessary to make up a serum, a toxin, an antitoxin. There is no opportunity for "high brow" posing or showing of superior knowledge or laboratory training in the preparation of sera to be dosed out in ampoules. Since the patients contract pellagra from drinking soft water, have them drink hard water to avoid contracting pellagra. This observation is not so profound as to require submission to the Rockefeller Commission or to the Carnegie Foundation. Any ordinary colored woman who washes

dishes or clothes or does common scrubbing knows when the water is hard or soft. If hard water is not readily accessible put a little lime in the water at hand and make it hard. The purpose is to prevent people, the good, honest, average folks of the South from having pellagra, and not to promote abstruse, useless theorizing and so-called research.

Now if your patient has already acquired pellagra, that is, is manifesting the symptoms of the acid intoxication, it will be necessary to get the antidote into the system where it will counteract the poison. The best antidotes are the alkaline carbonates, the next, the carbonates of the alkaline earths. Because of the hydrochloric acid in the stomach, and also because of the fact that the chlorids exert no beneficent influence, it is necessary to use an excess of alkali if administered by the mouth or to administer a mild, bland substance hypodermically. The best remedy for hypopermic administration is sodium citrate. It is neutral, does not generally cause any more inconvenience than a hypodermic of distilled water, is readily absorbed and is converted into sodium carbonate which at once commences to neutralize the acid intoxication. In view of these facts the writer cannot see why the strenuous advocacy of salvarsan and arsenic as specifics. Prepare a ten per cent solution of sodium citrate. Take up one cubic centimeter in an ordinary hypodermic syringe and inject deep into the tissues, preferably of the back or gluteal region. Repeat once a day for the first week or two, then on alternate days until the patient is well. The ordinary case will require from 30 to 60 days for a complete cure. This treatment will cure without change of residence, work, diet or environment, and even without change of drinking water, but it is well to drink copiously of hard water and to treat the symptoms symptomatically and to do everything to aid nature in the elimination of the intoxication while the antidote is doing its work. Fecal impaction should be broken up and the bowels cleaned out by enema. Then the bowels should be kept open so that they move at least once a day. The burning in the stomach should be allayed by milk of magnesia or calcium lactate, spasmodic vomiting controlled by concussion of the fifth dorsal spine and treated with gelseminum, the erythema treated with ointments and the general system toned up with tonics.

But in all the study of pellagra, do not get away from the following basic facts:

1. Pellagra is a chronic intoxication caused by colloidal silica in drinking water.
2. Pellagra is strictly localized and contracted in those regions where the water commonly drunk by the people is derived from clay.
3. Pellagra is prevented by drinking hard water. Lime can be added to soft water.
4. Pellagra is cured by the administration of any alkali which will neutralize the silica.
5. The simplest treatment is the hypodermic administration of a 10% solution of sodium citrate, once a day at first, later on alternate days.
6. The remedy has been successful when administered by the mouth. This method requires more, and a longer time.

CYSTICERCUS CELLULOSÆ OF THE HOG.

(Tænia Solium of Man)

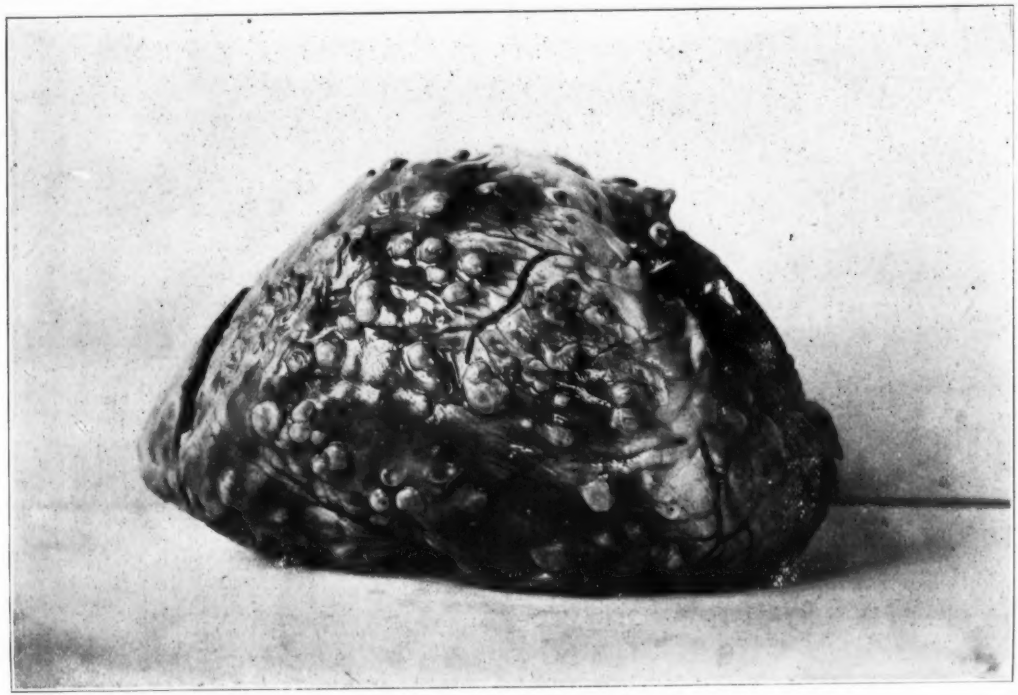
By Dr. W. H. DALRYMPLE, M. R. C. V. S., Baton Rouge, La.

Quite frequently the Department of Animal Pathology of the Experiment Station at Baton Rouge receives specimens of "measly pork" for examination and identification, and some of them come from practising physicians in the country who do not seem to be familiar with this condition. It has occurred to the writer, therefore, that a few words of explanation, showing the connection between cysticercosis in the hog, and tæniasis in man, from this particular parasite, might be of interest to those readers of the JOURNAL who may be, at times, confronted with the human tapeworm problem in their practices.

The accompanying illustration is a beautiful specimen of the hydatid cysts appearing on the surface of the heart of a hog which, as we have just indicated, was sent to the Experiment Station for identification. The condition is not confined to the heart, however, but may be found in other parts of the general musculature, a number of specimens of which we have in our pathological collection.

Wherever there is found tæniasis in man, locally, there is generally, also, found some hogs suffering from cysticercosis, and vice versa.

The *Tænia solium* is, of course, a two-host parasite, viz., man



Cysticercus Cellulosæ of the Hog. (Tenia of Man).

and the hog. The defecations of the human being containing the eggs of the parasite are ingested by the hog, and the eggs after hatching, become encysted in some part of the muscular system of the animal as the *Cysticercus cellulosæ*. If permitted to remain there, their life-cycle is cut short, and no further damage is done by them, except to the hog. But if this "measly pork" should be consumed by the human being, not sufficiently cooked to destroy the cyst, it then develops into the *Tænia solium* in the intestinal canal, and produces the tæniasis periodically encountered in certain localities. In short, the hog gets the egg from the contaminated excrement from the human being afflicted with tapeworm; and the human being becomes infested with the tapeworm by consuming insufficiently-cooked pork containing the cyst. And while this condition is one that does not seem so well understood as it might be, even by practitioners in country districts, it ought not to be difficult of eradication, especially if more attention was paid to the inspection of meats that are exposed for human consumption.

METHOD TO LESSEN PERINEAL AND EXTENSIVE VAGINAL TEARS DURING CHILD-BIRTH.

By PHILIPS J. CARTER, M. D., New Orleans.
From the Department of Obstetrics, Tulane University of Louisiana.

Both practicioner and obstetrician of the past seemed indifferent to the ordeals of suffering his patients would undergo in after years from simple tears of the vaginal and perineal floor during child-birth. My idea in this paper is not to commend, nor to criticise the old practitioner in his antique methods of delivery, but simply to improve upon what has puzzled obstetricians for a long time.

Obstetrics has for some unknown reason lain in a dormant state, in so much that it was looked upon with little consequence of its morbidity and mortality; but it has of late been modernized and brought forward to the realization of its more serious consequences in its ante-partum, intra partum, and post-partum stages. Statistics show that 30% of primiparæ are lacerated at the time of the birth of their first born, be it a first or second degree laceration, and 10% of multiparæ; 3% show tears extending down into and through the sphincter ani. We all know that a certain num-

ber of lacerations are unavoidable while quite a good many are avoidable.

In reading over a number of periodicals and personally watching obstetricians deliver cases, I find that all their methods are shown to be practically the same, as may be seen in any modern text book of obstetrics. We see the delivery of the head as it bulges the perineum retarded by the obstetrician pushing back on the head, claiming that in this manner it allows time for the perineum to dilate. The left hand is seen pushing the head down and back, while the massaging and the supporting of the perineum together with the perineal body is conducted by the right hand and actually lies in contact with this structure. Just for a moment, what does this do? We know that the purpose in this mechanism is to allow for the thinning out and stretching of the vaginal outlet and perineum. The left hand simply defeats nature's purpose at this stage, which is extension, and also presses the vaginal walls tightly together, making it more liable to slough and necrose. The right hand and especially the thumb and the index finger of the right hand are seen actually pressing against the perineum, therefore pressing it against the head. That this last measure does not support the perineum is self evident, it simply tends to increase the liability to necrose and tear, and at the same time tends to keep the head flexed, whereas it should be beginning to extend. It therefore follows when the head is delivered, it delivers in the largest possible diameter, the occipito-frontal. This would put the vaginal outlet and perineum on an enormous stretch, and the perineum most surely to give away. You cannot support the perineum, neither can you lessen the head pressure on the perineum, by holding or pressing on that structure per se.

The method I shall describe is not a new one, nor is it very ancient, but perhaps the obstetrician at times forgets its principles, and I simply want to recall something about which he has probably become negligent and especially for the young obstetrician who is going out to-day. The method allows due time for vaginal and perineal relaxation, allows the head to assume its smallest possible diameter in passing the vaginal outlet, relieves to a considerable extent the pressure of the head exerted on the perineum structures, and with a much less tendency to vaginal and perineal lacerations. This method can only be practised successfully with the woman on a table or some hard flat surface. The purpose of this

is to have your patient in such a position that the rectum is plainly visible, and the tip of the coccyx plainly felt.

The head is allowed to progress until it is seen to distend the vaginal outlet. Having the position of the head identified, you wait until the occipital, not the sub-occipital region, shows itself under the symphysis. At this time the brow is at or nearly past the tip of the coccyx. The left hand is then put, palmar surface, upon the presenting bulging occiput, while the pulps with the aid of the tips of the fingers of the right hand are introduced under the rectum and just in front of the coccyx, which is plainly felt with the presenting part. With the two hands in position as just described, pressure with the hand muscles only is exerted. The fingers of the right hand gradually but gently are directed downward, inward and upward, while the palmar surface of the left hand makes an upward excursion, this excursion being the first maneuver in the extension of the head. The effect of this combination means, first, beginning extension of the head, and second, the support of the perineum. The perineum is supported alone by the movements of the right hand in pushing the lower presenting part of the head upward. At the stage when the occiput is well under the symphysis, the brow has passed over the tip of the coccyx. Once the presenting part has passed over the coccyx, it is a very easy matter to cause the head to assume extension. By this process you merely support the head between the two hands, which act as a sling, and which, taking practically all the pressure off the perineum, gives less stretching of the perineum, in that you have substituted the smaller diameter of the head to be born. Having the occiput well under way of the left hand, and the brow in the right or fingers of the right, the same mechanism is kept up until the chin presents and can be felt at the coccyx, and which is in turn caught with the hand, while the upward movement of extension is still progressing. Once you have the chin and occiput caught between the two hands, you can hold the head there as long as you wish, and without any undue pressure, and without having to push the head back, fearing the perineum will tear from lack of dilatation. When you are ready to deliver, simply push up the chin with the right hand, guiding the occiput in the left, and in so doing, you are imitating the third maneuver in the mechanism of labor, still holding and extending the head by upward maneuver with the left, and very slowly you will see the sub-

occipito bregmatic diameter present into view, followed by the delivery of the forehead, nose and chin successively.

In many of these cases it is a very easy matter to get the head over the perineum without a tear, but some one has answered that he gets most of his tears in delivering the shoulders. The delivery of the shoulders should not give any more trouble than the head. Once the head is born, we have two alternatives; either to deliver the shoulders and body at once, which I always do, or wait until nature delivers it with her next pain. If you wait for nature to expel it with her next pain, you will find that the shoulders will almost pop out under your fingers, simply because you have an irregular body to deal with, and the same force expelling the head will expel the shoulders with much more rapidity, and in these instances you are liable to tear with the shoulders. Once the head is born, if you grasp the head with the palms of the hands, one on either side, and pull in a downward direction, the anterior shoulder will be seen to present underneath the symphysis. When this occurs, continue the pulling, with gentleness of course, until the anterior arm has been delivered as far as the mid portion of the humerus, after which the left hand and wrist encircle the head to lift it up, and at the same time place the right hand under the rectum and support the posterior shoulder, just as with the brow and chin. This maneuver will lift the shoulders from the perineal floor, and with little risk of tear. Needless to say the anterior, then the posterior hip are next delivered by the same mechanism.

I have seen failure after failure of the fetal head to be born, simply because prominent ischial spines acted as substitutes for the right hand, which were immovable, and not until the above maneuver was done and the brow lifted from the spines, was the head allowed to be born. This method allows a more safe delivery, and at the same time you can see any perineal tear that is going to take place before the head is born. In other words you can readily see, in successive steps, the perineum peeling back over the head.

To make your tears even less frequent, give your patient just a few drops of chloroform after you have the head controlled at the vaginal outlet, which will in turn relax the perineum, should there be any rigidity and at the same time this relieves the pain

that these patients experience, together with the retching accompanying this stage.

Rongy, in the *Journ. A. M. A.*, May 11, 1912, cites an instance in which he delivered a baby through the perineum, leaving a strip of perineum covering the fourchette, and exposing the bowel for quite a distance up. This was done after all methods of extending the head had failed. He could not get the head to extend. Whether or not he practised the maneuver I have just outlined, I am unable to say.

ASTHMATIC ATTACKS AND THE INHALATION OF FLOUR DUST.

By EMILE A. BERTUCCI, M. D.,

Adjunct Professor of Clinical Medicine, Louisiana Post-Graduate School of Medicine; Visiting Physician, Charity Hospital, New Orleans.

An asthmatic attack as we all know is a paroxysmal dyspnea due to a spasmodic contraction of the bronchial muscles accompanied with a wheezing sound, a sense of oppression and constriction in the chest, cough and a certain amount of expectoration.

All writers agree that in a great majority of cases of true so-called bronchial asthma, there is a strong neurotic element. Many look upon it as a type of neurosis in which there is a spasm of the bronchial muscles or a turgescence of the mucosa resulting from disturbed innervation, pneumogastric or vasomotor.

Before considering flour dust as one of the exciting causes in the production of the attacks of asthma, I will briefly consider some of the general facts which may be mentioned as to the etiology of this disease.

(1) A type of neurosis, in that it is more often seen in those with irritable and unstable nervous systems. Attacks being associated sometimes with neuralgia or even epilepsy.

(2) Spasm of the bronchial muscles a theory which has the largest number of adherents and the original experiments which were made by C. J. B. Williams and confirmed by Brodie.

(3) Fluctionary hyperemia of the bronchial mucous membrane (Traube); vasomotor turgescence (Weber); diffuse hyperæmic swelling (Clark).

(4) That it is a specific form of inflammation of the smaller bronchioles as described by Curschmann as "bronchiolitis exudativa."

(5) Spasm of the diaphragm and reflex spasm of all the inspiratory muscles.

According to classification, I will endeavor to make plain in order that we may understand what we mean when we speak of an asthmatic attack, viz.:

(1) Those asthmatic attacks due to organic disease: (a) Renal; (b) Cardiac; (c) True bronchial.

(2) Reflex Asthma: (a) Nasal affections the most common cause of asthma of nasal origin being ethmoiditis accompanied by nasal polypi. In other cases hypertrophy, hyperplasia, and other lesions appear to cause it. On the other hand, they may be present without exciting asthma. (b) Disturbances of stomach, intestines or reflex influences from the genital organs. (c) Hay asthma.

(3) Toxic asthma: (a) Indican asthma, by absorption of toxic material—indoxyl potassium sulphate—producing typical asthmatic attacks.

(4) Thymic asthma, supposed to be seen in children according to theory due to enlargement of the thymus gland in which there is spasm of the adductors of the larynx.

(5) Pressure asthma: mediastinal tumors, enlarged bronchial glands.

One of the most striking peculiarities is the extraordinary variety of circumstances which at times induce a paroxysm. Among local conditions, climate and atmosphere head the list. Breathing the air of a particular room or a dusty atmosphere may bring on an attack. Odors of flowers, hay, emanations from animals, as horse, dog, cat, etc., may at once cause an outbreak.

A case, which I will now cite in which the inhalation of flour dust seemed to be the only exciting cause, was a baker by occupation who said that he suffered from asthmatic attacks when engaged at his work, where the atmosphere was constantly laden with flour dust, and when away from this he went free of an attack, but as soon as he resumed his work in the bakery and inhaled flour dust he at once had a paroxysm of asthma necessitating a change of occupation.

He later became employed in a circus and for several years he

ceased to have an attack of asthma; the dust and small particles of sawdust emanating from within a circus tent, and the odor of animals seemed to have no effect on the sensitive nerve endings in the respiratory tract. The patient began to recognize the fact that the inhalation of flour dust was his special idiosyncrasy in causing an outbreak of asthma and he would keep away from flour laden atmosphere as much as possible. He had a cough of eight years' duration, causing him considerable annoyance at times, and for which he sought relief. It was only on close quizzing, however, that it was learned that he had been a sufferer from asthmatic attacks, he, himself, attributing the cause to the inhalation of flour dust while at work in the bakery.

He gives the following history:

R. H.—Age, 27. White.

Family History—Mother died of pulmonary tuberculosis; father living and in good health, being also susceptible to asthmatic attacks when exposed to flour laden atmosphere, having been previously in bakery business.

Previous History—Had measles, mumps and whooping cough when a child. Negative for venereal infection of any kind. Over-indulgence in alcohol and tobacco.

Present Illness—Chronic cough eight years duration, expectoration freely of a mucopurulent material but never streaked with blood. No loss of weight, no fever or night sweats.

Physical Examination—Heart normal. Lungs—chest—on inspection movements limited and a condition of general emphysema. **Palpation**—decreased vocal fremitus on both sides anteriorly. **Percussion**—Note clear and hyperresonant all over. **Auscultation**—Expiration prolonged and wheezy; signs of chronic bronchitis with few sibilant and sonorous rales. Liver not palpable; spleen not palpable. Sputum collected at numerous different times was negative for tubercle bacilli. Blood examination showed negative Wassermann reaction. Differential count on five hundred cells was as follows:

Small lymphocytes	20%
Large lymphocytes	5%
Polymorpho-neutrophiles	70%
Eosinophiles	1%
Transitional cells	4%

The total white cells count 6,944.

Urine examination: Reaction acid, specific gravity 1.024, and showed nothing of note.

Radiograph of chest showed no enlarged bronchial glands.

Examination of nose and throat did not reveal any abnormal condition, with the exception of a slight hyperemia of the nasal mucous membrane, there was a slight naso pharyngitis present, otherwise

normal. He was of a nervous temperament, and a neurological examination showed markedly exaggerated patella reflexes and a spurious ankle clonus, spurious because it was not like the true ankle clonus found in organic disease. Other neurological signs, negative. The reflexes spoken of above were not regarded as indicative of any organic disease of the brain or spinal cord but that such conditions are usually seen in patients of this neurotic type and habits.

In order to verify that the inhalation of flour dust was the causative factor of asthmatic attacks in this individual some flour was procured with the patient's consent and I then proceeded to dust it around him until the air he breathed contained a quantity of the dust; he at once began to have an asthmatic attack not unlike one seen in true bronchial asthma, lasting, however, only for a short length of time.

This particular case bears a striking resemblance to hay fever in some circumstances, in that both are due to the peculiar action of a specific irritant:

Hay Fever—By the action of the pollen of certain grasses and plants, and in this case by the action of flour dust upon the hypersensitive mucus membrane. However, the irritant of hay fever had no effect whatever in this individual, while on the other hand that of flour was a striking factor in the production of an asthmatic attack, the patient himself being aware of the fact that the odor of plants, animals or other odors would not precipitate a paroxysm of asthma. These attacks were never attended with the initial sneezing as seen in majority of cases of the so called *"autumnal catarrh."* In hay fever it is generally believed that the exciting causes are the emanations from certain plants and animals, chiefly the following:

Graminacæ, Solidago vigaurea (golden rod) — *Ambrosia artemisiæfolia* (rag weed)—cats, dogs, horses and cows.

The emanations from grasses and other plants, which cause the paroxysmal symptoms, are probably their pollens.

Again, hay fever is somewhat seasonal in character in that it occurs most frequently in August and September and less frequently in June, when the roses are in bloom.

To revert, we are dealing here with a definite respiratory irritant, that of flour, which in this case causes an outbreak of asthma; while it may not excite an attack in all cases, it has been found to do so in this case. Flour dust can be regarded, therefore, as an exciting cause in the production of asthmatic attacks.

SYMPOSIUM ON GALL-BLADDER DISEASE.

I.

THE ETIOLOGY AND PATHOLOGY OF GALLSTONES.*

By JNO. A. LANFORD, M. D.,

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By the term gallstones we mean a firm, more or less oval body formed in the gall bladder or some of its ducts and giving rise to clinical symptoms somewhere in the alimentary tract.

These stones are composed for the most part of cholesterin combined in varying proportions with salts of lime, magnesia, bile acids, fatty acids and traces of iron and copper. They may be single, in which instance they are ovoid in shape, and may obtain a relatively large size, stones five inches long being recorded. As a rule, they are multiple, and it is not uncommon to find a hundred or more in a given case, and occasionally the number may be astounding. Otto reported having found 7800 in a single case. These large numbers are of calculi varying in size from a grain of sand to a small shot. When moderately numerous they show signs of mutual pressure, with polygonal forms having many facets. Occasionally several stones of relatively large size may be in the bladder without showing any facets. Gallstones are of different colors, the lighter ones of a yellowish tint, being composed largely of cholesterin in crystalline or amorphous form, while the dark ones are largely made up of bile pigment. On section the calculus shows a nucleus made up of bile pigment, desquamated epithelium, bacteria or debris of some character, and an outer layer of cholesterin or bile pigment arranged in a concentric or radiating form.

Etiology: In olden days it was the belief that gallstones were due to a coagulation of the bile, induced by increase of heat in the liver, and it is only in recent years that this subject has been cleared up. The first step in this direction was by Naunyn, who showed that the two chief constituents of gallstones, cholesterin and bilirubin, were in a large part the product of the mucosa of the gall bladder; that these salts were formed as the result of certain alteration in the mucosa causing an exfoliation of the epithelium and an increased pouring out of mucus from the glands. The next discovery was that of

*Read before the Orleans Parish Medical Society, June 28, 1915. [Received for Publication August 4, 1915.—Eds.]

Welch who, in 1890, demonstrated the presence of micro-organisms in the centers of the stones. With these facts in mind, many workers studied the problem, and in 1897, Gilbert and Fournier successfully accomplished the experimental production of gallstones by injecting microorganisms into the gall bladder of animals. They used an attenuated culture, preferably one which had been grown in a medium of diluted bile for several weeks, as virulent organisms produced an acute cholecystitis and the mucosa being so damaged by inflammation and ulceration that over-productions of cholesterin were entirely prevented. The organisms reported by Miquot as capable of giving rise to gallstones are *B. coli, B. typhosus, Staphylococcus, Streptococcus,* and *B. subtilis.*

While it is without doubt that a low grade of inflammation induced by microorganisms and resulting in a "lithogenous catarrh" is the most important single factor in the production of gallstones, there are other very important accessory factors. Chief among these is anything which will produce stasis or retention of the bile in the gall bladder, as it has been proven that if the bile can escape freely from the gall bladder any organism injected quickly finds an exit. Among the more common causes of stasis may be mentioned corset-wearing, enteroptosis, nephroptosis, pregnancy, and occupations requiring a leaning posture. Lack of exercise, sedentary occupations and constipation are also important factors.

Foreign bodies have been shown to be the nucleus of gallstones, but it is necessary that the substance be fixed and associated with a low grade of inflammation before any deposit of cholesterin takes place.

Since 50% of cases occur in persons over 40 years old and 75% in women, age and sex seem to be predisposing factors. Naunyn reports that 90% of cases found in women were in those who had been pregnant.

The gallstones found in new born infants, and which are necessarily formed during intra-uterine life, are not of bacterial origin, and are most probably not true stones but masses of inspissated bile. In old people gallstones are frequently found at autopsy, they not having given rise to any pain or symptoms during life, and it is possible that their origin is not due to a low-grade infection, as Becquerel has observed that the blood

of old people contains a larger percent of cholesterin, which is poured out in larger quantities through the mucosa of the gall bladder, probably resulting in the formation of stones. This fact would suggest that gallstones in the aged are caused by a similar process which results in atheroma of the vessel.

Since bacteria are such important etiological factors in the production of gallstones it might be interesting to consider their routes of entrance into the bile passages. There are two chief ways—first, by way of the common duct from the duodenum; and second, by way of the blood current, chiefly from the portal vein. The first is probably the more frequent. While the *B. coli* are common inhabitants of the alimentary tract and are relatively in small numbers in the duodenum, they are normally present in the ampulla of Vater; however, they do not extend up into the gall bladder unless stagnation be present, as Sherington has shown that no bacteria can enter the bile ducts so long as the bile remains and is expelled at regular intervals.

The question of the infected organism gaining entrance to the portal vein has been the subject of much experimental work with divergent results. Adami, however, writing on this subject, said that:

"we may assume (1) that colon bacilli in small numbers are in the healthy individual constantly finding their way into the finer branches of the portal circulation and (2) that one of the functions of the liver is to arrest the further passage of these bacilli into the general circulation and to destroy them thru the agency of the specific cells of the organ. Then, if the action of the liver cells has been disabled by the toxic products of the bacteria these may reach the bile and spread through the gall bladder and ducts."

In recent years it has been the experience of many surgeons to find that many cases of chronic appendicitis are associated with gallstones, and it is very probable that this focus of infection has more or less constantly thrown off bacteria into the portal circulation, some of which have found entrance into the gall bladder and setting up a low grade of inflammation in the mucosa has resulted in the formation of calculi. This possibility becomes more rational when we recall that most cases of chronic appendicitis are associated with constipation, which in its turn results in more or less stagnation of the bile in the gall passages.

In concluding a consideration of the etiology of gallstones it might be well to repeat that two essentials are needed: (1) A low grade infection of the gall bladder and its passages, and (2) obstructions to the free exit of the bile from the ducts.

Pathology: While gallstones are a pathological condition resulting from several processes named, they may occur without causing any evidence of their presence, post-mortem examinations having shown that ten percent of all bodies examined had calculi in some part of the bile passage; however, they frequently produce grave and serious pathological conditions of great diversity. Among the more frequent conditions is:

Cholecystitis: The presence of calculi acting as an irritant tends to cause inflammatory changes in all the coats of the gall bladder; the mucosa becomes thickened and frequently mottled, showing here and there small black spots which, on microscopic examination, are found to be made up of cholesterin and bile salts. In parts it has shed its epithelium and patches of ulceration are to be seen; the muscular layer at first becomes thickened but is later replaced by new connective tissue varying greatly in thickness. This connective tissue extends into the mucosa with, at the same time, an atrophy of the glands, resulting in the lining of the gall bladder becoming almost perfectly smooth; later there is none of the normal structure remaining, the sac being made up of fibrous connective tissue which finally contracts, resulting in small sclerotic sacs. Early in the disease there is some edema and congestion with increase of the secretion of the mucosa. If the infection is severe the inflammatory conditions extend through the serous coat, resulting in a peri-cholecystitis with formation of adhesions between the gall bladder and the adjacent structures. Occasionally the contraction of the new bands of connective tissue will result in the formation of diverticula in which the gall stones are located. In the more acute forms of inflammation patches of gangrene may result with rupture in the peritoneal cavity, and an extension of the inflammatory processes. This acute inflammatory process usually involves the gall passages, and as it subsides results in the narrowing of the lumina producing more or less stasis of the bile. Another frequent pathological change is

Obstruction: Quite frequently the stones in attempting to pass through some portion of the duct produce more or less obstruction of the lumen, resulting in retention of bile. This obstruction may occur in the cystic duct or the common duct, and is usually associated with a definite train of symptoms. This obstruction within the cystic ducts results in dilatation of the gall bladder (Hydrops vesicæ felleæ). In acute obstructions of the cystic duct the contents are mixed with bile and mucus, or muco-purulent material, the obstruction resulting in an exacerbation of the inflammatory process producing acute cholecystitis with rupture, or there is a subsidence of inflammation and the condition becomes chronic. In chronic obstructions the bile is replaced by clear fluid. This fact is well to be kept in mind as the distention may become enormous and be mistaken for a cyst of some other organ. Lawson Tait reports a case which he mistook for a paro-ovarian cyst, and an operation found that it was a distended gall bladder containing 11 pints of a clear gluey fluid. Jaundice is usually absent in the chronic cases.

In obstruction of the common duct jaundice is extreme, the branches of the hepatic duct being much distended and resulting in enlargement of the liver. This obstruction is frequently followed by an infectious and suppurative process.

Among the more remote effects of gallstones may be mentioned Biliary Fistulæ and Intestinal Obstruction.

Biliary Fistulae: These are not unusual. There may be a communication between the gall bladder and hepatic duct or the gall bladder and a cavity in the liver itself; more rarely perforation of the common duct into the portal vein occurs. Perforation into the peritoneal cavity may occur. Fistulous communications between the bile passages and the gastro-intestinal canal are rather frequent, the most usual form being into the duodenum; the stomach, ileum and jejunum are more rarely involved. These communications may occur without producing any definite symptoms, they resulting from pressure atrophy of the bile passage and intestinal wall which are bound together by adhesions, so that no escape of the bile into the peritoneal cavity occurs. Occasionally the urinary passages may be opened and the stones found in the bladder (urinary). A more frequent fistulous opening is into the lung, there being

ten or more cases recorded. This results in the expectoration of bile in more or less large quantities. The most common fistulous communication is the external or cutaneous. Most of these occur in the right hypochondrium, although a large number are found in the region of the navel.

Intestinal Obstruction is not a very common occurrence but a fair number of cases is recorded. The most frequent location for this obstruction is in the ileum where a single or many small stones may completely close the lumen.

Malignancy: When we recall that a long standing irritating process is claimed by some authorities as a cause of malignant change, and that gallstones are found in the majority of cases of primary carcinoma of the gall bladder, malignancy might be considered as one of the remote pathological processes ot gallstone.

In conclusion, the pathology of gallstones may be divided into two divisions: (1) The aseptic, mechanical accidents in consequence of migration of stone or of obstruction either in the ducts or the intestines, and (2) the septic infectious accidents, either local or general, the biliary fever, and the establishment of fistulae.

II.

DIAGNOSIS OF GALL-BLADDER DISEASE.*

By J. B. ELLIOTT, JR., M. D.,

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There are two points to bear in mind in opening a discussion on the Diagnosis of Gallstones:

1st: That it has been proven by Kehr and others that only five percent of those harboring gallstones present symptoms of their presence;

2nd: That the only positive diagnosis of gallstone disease is the finding of the gallstones in the feces, or by operation.

In order to bring the diagnosis of gallstones before you more concretely, I reviewed the histories of all those operated upon for this condition in the Charity Hospital during the years 1912-1913. Of the twenty-four cases occurring during these two years, there were seventeen females and seven males. The

*Read before the Orleans Parish Medical Society, June 28, 1915. [Received for Publication August 4,, 1915.—Eds.]

average age was 41 years plus. Fifteen, or 62% plus, gave history of jaundice. The average duration of illness from first symptom to time of operation was 3.3 years. Only six cases gave histories of sudden onset, while ten declared that symptoms at first were very mild. Only six cases gave a *positive* history of preceding typhoid fever. Ninety percent of the cases had some fever during the attacks or before operation.

From a study of these twenty-four cases, we can draw the following picture of a typical case of gallstones. Patient, after years of dyspepsia, will be seized with a sudden attack of intense cramp-like or colicky pain in the region of the gall bladder, this pain extending through to the back, being especially violent between the eleventh and twelfth rib. Patient will often vomit or at least be nauseated. In a vast majority of cases there will be a slight icteric hue to the eye; the urine will generally be highly colored, and in some cases we may find clay-colored stools, this only when the common duct is involved. Many of these cases complain of gas pressure in the region of the stomach. We also have, immediately after the pain is relieved, a little rise of temperature, from ninety-nine and one-half to one hundred degrees, this being due to the accompanying inflammation of the duct or gall bladder; in increase of leucocytes is generally present. On the second day there will be present much soreness in the region of the gall bladder, while during the attack the rectus muscle is rigid, this rigidity lasting until the underlying inflammation has subsided.

Let me give you a typical case:

Mrs. W., age 59, mother of one child; lived in the country all her life; had indigestion for the past fifteen years, always coming on after meals and almost daily. This caused no loss of flesh and no vomiting. Seven years ago commenced to have colicky pains in the region of the stomach, which would come on suddenly and generally during the night. For the past three or four years had it only three or four times a year. During the last two years attacks were much more frequent, almost one a month. With the intense pains there was always vomiting and highly colored urine, and intense soreness in the region of the gall bladder. Temperature would rise to 100° 100½° with each attack. Sclera would be slightly tinged with yellow following each attack. This I take to be a pretty clear case of gallstones but a diagnosis could not be positively made until the stones were taken out.

I wish now to review briefly differential diagnostic points between gallstone and other diseases of the gall bladder and adjacent organs. One of the most common mistakes in medicine is the confounding of gallstones and hyperacidity, or rather hyperchloridia. In my own experience, acute indigestion, giving intense pain without vomiting and purging is a rare condition and generally means gallstones. The patient will tell you that he has had indigestion for years; that it is getting more frequent and that it has little or no connection with food eaten, and that it is paroxysmal in character. This to me negatives gastralgia entirely. It means gallstones.

I wish to cite here a case which I saw on the 31st day of March, giving the following history:

A man aged 24 years, foreman on a railroad, came to me complaining that for the past three years he had been having attacks of pain in the belly; that he had never vomited; that the pain would spread all over his whole body, giving him cramps in the muscles of the legs and arms; that the cramps would last about forty minutes; that he would always feel better if he could vomit; that after the last attack there was some soreness over the whole abdomen; that he has lost twenty-five or thirty pounds in the last year but that he could always trace his attack to over-indulgence in food or alcohol. His physician told me that he had never been jaundiced in any attack nor had he had any fever in these attacks. Examination showed normal heart except for a little extra systole; B. P. normal; liver normal as to size; no jaundice; had never had typhoid fever; a stomach examination made after the regulation test breakfast showed a free H Cl of 80, with a total acidity of 90, and the patient has been relieved of the attacks entirely by a careful dieting and the use of enormous doses of bicarbonate of soda. I believe such cases, however, to be rare and in any event if such a case did not respond to treatment rapidly would certainly advise exploratory laparotomy.

The differentiation between cholecystitis and gallstones is practically impossible in the majority of cases, and is unnecessary, as both conditions, if chronic, require the same treatment.

Cholecystitis, chronic in character, as we all know, may give no pain whatsoever, but does give intermittent fevers with or without increased leucocyte count. I should like here to cite a case seen only in the last two weeks bearing on this subject:

Mrs. A., aged 60, mother of three children, who has been healthy all her life up to a year ago. Since that time has been having fevers at irregular intervals, fever rarely lasting longer than two weeks at a time and only in the past month has she had any nausea with her

febrile attacks; never any colicky pains but only a feeling of fullness in the region of the stomach and rigid rectus muscle during and after an attack of fever. Her blood count was normal both as regards white cells and differential count. Hemaglobin 75% and she had lost twenty pounds in the past eighteen months. Urine was normal in every respect. After the last febrile attack had subsided, a mass could be felt in the region of the pylorus which made me fear malignancy or syphilis of the liver, yet the high febrile attacks could not be accounted for with either of these diagnoses. I therefore diagnosed cholecystitis and advised drainage. An opening was made by Dr. Maes under local anesthesia, and we found a gall bladder containing seven ounces of bile, rather thick in character but not purulent; also two enormous gall stones, the size of a hickory nut. This case exemplifies the difficulty in making a positive diagnosis without an exploratory laparotomy.

The differentiation between duodenal or gastric ulcer and gallstones is at times most difficult, and we have to depend here largely on the fact that in ulcer we have pain almost daily and always have high acidity of the stomach contents and occult blood in the stools, but the pains are never cramp-like in character, and jaundice is rarely ever present. The X-ray is often of great value in this differentiation.

A stone in the right kidney may simulate at times gallstone disease, but a thorough and careful examination of the urine with catheterization of the ureter will clear up this point at once. A Dietl's crisis of the right ureter may cause confusion judging purely from the history, but the absence of fever, jaundice or tender liver would help to rule out the gall bladder.

Appendicitis sometimes gives trouble, and I know of a case that occurred in the city recently where the patient had intense colicky pain in the region of the gall bladder with jaundice. An operation which had been advised showed the gall bladder to be normal, no stone present, but the appendix adherent to the gall bladder and inflammation of the organ.

I have seen only recently a case of what I took to be lead colic which presented many symptoms of gallstones. Stippling of the red cells with a history of exposure to lead infection probably saved the patient from an operation, and he is clearing up nicely now under magnesia and potash.

The gastric crisis of locomotor ataxia has been operated on more than once for gallstones. There is a case at present in Ward 21 of the Charity Hospital which has been saved from

the knife twice in the last three years. The attacks simulated exactly gallstone colic. The absence of jaundice, fever and tenderness along the lower edge of the liver and bile colored urine, with the presence of the loss of patella reflex and Romberg sign clinched the diagnosis.

Although it may seem farfetched, I have seen a case of adherent pericardium accompanied by Angina Pectoris giving symptoms almost identical with gallstone colic, and one case in which the two were combined.

In conclusion, I want to emphasize again the importance of not calling gallstones colic gastralgia, as this latter condition, in my mind, is very rare, and it is especially rare in persons past 40 years of age.

III.

TREATMENT OF GALLSTONE.*

By OTTO LERCH, Ph. D., M. D.,

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The first question that arises when a diagnosis of gallstones has been made is whether an operation is necessary, and whether that has to be immediately done to protect the patient.

The views on this subject differ widely between internist and surgeon, and even amongst the latter are largely at variance.

Some advise in all cases of biliary calculi an immediate operation, allowing only a small percentage to be treated by medical methods; others advise, and this seems to be the majority, that only a small percentage of gallstone patients should be operated.

Kehr operated only on 1,300 of 4,000 patients that consulted him for gallstones, and comes to the conclusion that only 20 percent of patients suffering from gallstone diseases ought to be operated and with others is a decided opponent of an early operation during the first attack.

The following table, published by this author in 1909, is of great interest:

*Read before the Orleans Parish Medical Society, June 28, 1915. [Received for Publication August 4,, 1915.—Eds.]

	Pure Stone cases.	Benign simple cases.
Surg. clinic of Heidelburg	15.0	
Death rate 1904-1909	4 %	11.3%
Mayo Brothers		
in 845 cystotomies	2.3 %	
in 319 ectomies	3.43%	
Koerte 327 simple cholelithiasis		
238 pus and choledochus stone		
21 with simple complications	10 %	
Borelius 50 estomies	0 %	
Surg. clinic University of Giessen		
513 pure stone cases	9 %	
46 with simple complications	8.69%	
Kocher,		
103 pure stone cases	2.0 %	
Kuemmel,		
169 pure stone cases	4.7 %	
14 with simple complications	14.3 %	
Kehr,		
238 pure stone cases	2.9 %	
73 with simple complications	20 %	

The Mayo brothers, in 207 operations involving the common duct, had the following death rate:

In 105 cases, without pressing symptoms.....2.9%
In 61, with fever, chills and jaundice..... 16%
In complete occlusion of choledochus..... 34%

Recidive colics due to stones or adhesions have been reported by a number of observers.

In 1911 the Mayo brothers published 4,000 operations for cholelithiasis, with a mortality of 2.75%. In 2,920 operations the disease was confined to bladder and cystic duct—mortality, 1.8%; in 2,165 of cystotomy, mortality 2.4%; and in 492 operations involving the common duct, mortality 8%. In operations during quiescent state, 3%; with jaundice, 10%; and with complete obstructive jaundice, 25%.

Dr. Fossier, who has collected the cases from the Charity Hospital for me from 1906 to 1914, found:

In 96 operations for cholelithisasis, mortality 21.5%. In 58 cases treated medically during the same time, mortality none.

Lehnhartz in his article on the treatment of the diseases of gall bladder and ducts, in which he also discusses the indications for an operation, quotes statistics of the Eppendorfer Hospital, and finds that from 109,700 patients treated from 1902 to 1908, only 515 suffered from liver or gallstone diseases, exclusive of cirrhosis, and that of 1,800 autopsies, death was due only 6.7% to gallstones and of this in 72 or 0.4% to carcinoma of the gallbladder.

From his practice, he reports 10-12 deaths caused by diseases of liver and gallstones from 10-13000 patients, many of these had

passed through the surgical ward. Cause of death, cholangitis and cholecystitis and septic pylephlebitis. He saw most severe cases with chills and high fever often get well, even with colon bacilli in the blood, if not operated.

Cohnheim advises not to operate till all medical treatment has failed.

I believe it is advisable to call a consulting surgeon early not to miss the time when an operation may become necessary.

If a stone lodges in the cystic duct causing colics and swelling of the gallbladder, it is in the experience of every physician that such stones usually pass under treatment, leaving the patient in perfect health during the remainder of his life; an early operation in this case has not been adopted generally. In repeated attacks with renewed inflammation of the gallbladder, physician and surgeon have to decide whether an operation is advisable. The prognosis is better if the patient is operated between attacks free of fever and with reduced inflammation. In cases with severe general infection, repeated attacks with chills and fever, especially when chronic inflammation has produced a shrunken gallbladder, an operation is indicated, unless disease of the heart or a weak heart and a severe condition contraindicates the operation.

If a stone closes the common bile duct, it is better to wait, unless the duration of the trouble, the general condition, and the wish of the patient, call for an earlier operation. Jaundice makes the prognosis more grave.

The treatment of the biliary colic is clearly indicated. Pain has to be stopped, the expulsion of the stone favored, inflammation subdued, and the strength of the patient supported. Morphin is a supreme remedy to stop pain and may be given in combination with atropin or alone.

The muscular spasm is relaxed, bile can flow again and pushing the stone onward, prevents injury and necrosis due to pressure until the effect wears off and a new injection has to be given. The treatment has to be repeated until the stone has passed into the duodenum.

Opium and belladonna suppositories occasionally stop pain. Pyramidon, antipyrin and other coal tar preparations are useful in minor attacks, and the salicylates in large doses give occasionally satisfactory results. The physiologic measures of treat-

ment are all of the greatest importance. Rest, mental and physical, heat in some form, and if bath is not well borne, then ice bath. Electricity and massage if the physician is thoroughly familiar with the method. Unskilled hands may do great harm and cause rupture of the gallbladder.

The patient has to be carefully watched, and especially the aged need analeptica, like coffee, tea or alcohol in some form.

The treatment of gallstone disease is indicated by its etiology, pathology and course. The presence of an inherited predisposition and that it is only exceptionally found in childhood, rarely in the young, that it becomes more frequent with advancing years and its great predominance in women, allow of but one explanation, "a poor abdominal circulation." The inherited predisposition in enteroptosis with its pendulous abdomen and relaxed abdominal walls or rigid recti and diastasis, the greater frequency increasing with years, is due to the adoption of an indoor life and late hours, with usually a more generous diet to burden the circulation. The greater frequency in women is due to an indoor life, as well as to the relaxation of the abdominal muscles after childbirth and to lacing, which interferes with diaphragmatic breathing.

Pure and free flowing bile prevents the formation of stones and dissolves them after they have been formed; this is the only solvent of biliary calculi so far found.

Frerichs and other found calculi small and crumbling after treatment; I can confirm this observation. Naunyn has shown that calculi inserted into the gallbladder of dogs are dissolved within two months. A pure, free flowing bile is only possible when the abdominal circulation is in good condition, and our therapeutic measures must be directed to produce it. A bandage is necessary in almost every case to narrow the abdominal cavity and give counter pressure to diaphragmatic breathing. It is a substitute for muscles. I have described to this Society before a bandage designed by me for this purpose.

Exercise improves the general circulation, and as a part of it the abdominal circulation. Out of door, as well as room exercises, are useful, and the latter must be directed to press upon the abdomen and selected to favor the respiration. Rest is of importance to ease the heart and prevent congestion of the abdominal organs.

Heat, as by full warm bath, sitz bath, etc., to relieve pain, influences the circulation and reduces inflammation; electricity and massage are used for the same purpose.

Diet is of importance to save the liver parenchyma from further injury, and the literature on this subject is extensive. Some advise a vegetable and others a meat diet, and others again a mixed diet. A moderate amount of albumin and fat with a larger quantity of carbohydrates, preferably in the form of the tender green vegetables and fruit juices, is the best combination to save the liver.

If the pancreas is seriously involved, it is difficult to nourish the patient, and additions of carbohydrates, albumin and fat must be excluded or greatly diminished, as one or the other of the digestive functions fail. Pancreatin and similar preparations may be given as a substitute of the lacking secretion.

In prescribing a diet in this as in any other disease, it is of the greatest importance to consider the present state of nutrition of the patient, the assimilating power, the age, the occupation, the climate and the season. These are points rarely taken into proper consideration. It is usually the nutritive value that is considered most—often with exclusion of all others.

A combination of the physiologic methods with drug treatment is indicated in every case in which the disease is well established. It was formerly thought that certain drugs dissolve stones. This view has been entirely abandoned; nothing but a pure alkaline free flowing bile will accomplish this. Durand's remedy, a combination of turpentine and ether, is no more, and it is disagreeable to take, and we possess antispasmodics and cholagogues far superior to this formerly highly prized remedy.

Olive oil has become quite a popular remedy in this country as well as in Europe. It is given during the acute attacks, as well as in chronic cases.

Calomel is another remedy freely used in affections of the liver and gallbladder. It increases secretion and peristalsis; a larger quantity of bile is found in the dejections after calomel has been administered. I have often observed that liver and gallbladder shrink considerably after its use, and dilated hearts become smaller and the pulse firmer and fuller, high tension lowered. This influence upon the circulation is of great importance when the object is to produce a pure liquid bile.

A number of remedies are used to increase biliary secretion, of which at present the bile salts are in great favor. It has been proven on animals and men that they increase the fluidity and quantity of bile. Sodium salicylate has been long known as an efficient cholagogue and the modern preparations like aspirin, displosal, etc., have the same effect; they are better borne by the stomach, cause less disagreeable systemic symptoms than the salicylate. Podophylin acts as a cathartic and relieves congestion and torpidity of the liver. Sanguinarine increases the flow of bile and the digestive glands in general. Julgland-in, baptisia, hydrastin and various other alkaloids are all freely used for the same purpose with advantage. Ammonium muriate stimulates the secretion of all the mucous membranes of the body and is an excellent remedy in torpor of the liver and chronic hepatitis. It must be given in large doses to be effective.

Chologen is a combination of various drugs, among them calomel and podophyllin in minute quantities. It has acquired a great reputation. It has to be given from six to eight weeks. The treatment of gallstone and liver disease with the mineral waters has stood the test of centuriees.

There can be no question that the change from a sedentary, indoor life, with the worry and care attached to the daily occupation, to a life in the open, free of care and worry, full of hope to regain health, with regular hours and a suitable diet prescribed by a skilled physician, had much to do with these cures. Notwithstanding, the waters have therapeutic properties.

They represent an alkaline solution, which, given warm or hot, one hour before each meal, bathes the mucous membrane of stomach and intestines, frees them from mucus, stimulates peristalsis and subdues inflammation. During their passage through the gastro-intestinal tract, some of the mineral water is absorbed and increases the fluidity, quantity and alkalinity of bile. It seems to be rational that a blood richer in water and alkaloids produces such changes, though experiments have not shown a direct influence upon bile formation.

The discovery that many of the famous mineral springs are radioactive and that this is due to emanations of radium adds a new factor to explain the efficiency of these waters in disease.

When symptoms of a disease make their appearance, every organ of the body is more or less affected, and it is irrational to try to cure the patient by treating one organ or a disease. All organs make blood, or distribute it, that is, they add to or subtract something from the blood to make it perfect, so that each cell of the body finds its proper food. When one fails, all fail. In order to function well, each organ must get a sufficient supply of pure blood, and this only is possible when blood distribution is perfect. *"Blood purity depends on blood distribution."* The gastro-intestinal tract is outside of the body proper, and its cleanliness has to be looked after, or even more so, than the cleansing of the skin. The treatment of gallstone disease does not differ in this respect from the treatment of any other disease. To treat gallstone disease we have to influence the general circulation, and especially the abdominal circulation, to cure inflammation and to produce a free flowing alkaline bile to expel stones, make them quiescent, or to dissolve them, with all therapeutic measures and means at our disposal, not with one drug or one method.

Medical treatment restores the patient to normal or as much so as that can be done. Surgery removes diseased tissue and must be preceded, combined and followed by medical treatment to be of the greatest permanent benefit to the patient.

IV.

SURGICAL TREATMENT OF GALL-BLADDER DISEASES.*

By F. W. PARHAM, M. D.,

Professor of Surgery, Graduate School of Medicine, Tulane University, New Orleans, La.

There has been so much written and well written on this subject of late years, that little can be said that might not be considered trite. The affections of the biliary apparatus are, however, of the greatest interest to physician and surgeon alike, and many problems yet remain unsolved. The time is too short and the weather too hot to go into anything like an exhaustive discussion of the many phases of the subject, but I should like to make a few brief remarks under the following heads:

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*Read before the Orleans Parish Medical Society, June 28, 1915. [Received for Publication August 4, 1915.—Eds.]

1. **The indications for operation, and**
2. **The character of the surgical intervention demanded.**

Few internists or surgeons would hesitate to advise operation in cases with the clear-cut, classic symptoms of biliary infection. No longer is jaundice considered necessary to justify surgical intervention; while confirmatory, it is not even essential for a diagnosis of biliary obstruction. We all admit that serious biliary disturbance may exist without it, calling for prompt and radical interference. The clinical history, however, of repeated attacks of epigastric pains with gastric disturbance is often sufficient to point unerringly to the gall apparatus as the source of the trouble; there is no longer room for doubt when the case is seen during an attack and the palpatory tests of Murphy and others are tried. The diagnosis being then easily established, the case is at once removed from the province of the internist and should be turned over to the surgeon. But in the second category of cases the symptoms are vague and the diagnosis most difficult, yet in these very cases the interference with health is often marked and the disability very great. These are the cases that deserve our most careful consideration and offer opportunity for the display of most diagnostic acumen. These cases demand just as insistently the relief which the classic cases get, but this relief is often delayed because of the more difficult interpretation of symptoms. These are the borderline cases where controversy still rages as to whether they are medical or surgical cases. In many the doubt may only be resolved by a surgical exploration.

Symptoms formerly regarded as necessary for a diagnosis are now regarded as terminal. While the classic cases should be operated on and operated promptly, precious time has often already been lost, the patient has been allowed to suffer unnecessarily for perhaps years, and the surgeon at operation finds himself in the presence of the later pathology, marking irreparable tissue destruction.

These cases were just as much surgical cases at first, but were allowed to drift along from week to week, month to month, and even year to year, with health continuously undermining, simply because the early or inaugural symptoms were not given their proper significance. "Not a few have been treated by many hands, test-mealed, lavaged, dieted, alkalined, given seda-

tives, rest cured, and not a few have had their appendices taken out. They float around from one to another, from one clinic and hospital to another, from one stomach specialist to another, and even from one surgeon to another, the symptoms persisting all along the line, and yet as a class they are not difficult to diagnose."[1] Why is it, then, that we are so "pitifully helpless" in such cases? Moynihan says: "It is, I venture to say confidently, because we rely for our diagnosis not upon inaugural symptoms, but upon those of late appearance; we confuse far too frequently the symptoms of a tardy complication with those of the original morbid process itself. * * * We dare not, for example, hint the presence of gallstones till jaundice comes, though symptoms of the plainest meaning have been present for years, and in spite of the fact that jaundice is an infrequent symptom of gallstone disease.[2] I wish to say right here that great improvement in this respect has been apparent in recent years. Indeed, I venture to say that in the matter of diagnosis the internist has far outstripped the surgeon, whose hand is often quickened by the judicious but not vacillating advice of his more painstaking medical confrere. But there is yet much advance to be made in the diagnosis of such cases as those of which I now speak, and there is need of closer association and better co-operation between the internist and the operating surgeon. There is apparent now greater consideration for the clinical history and a search after the early pathology. How one is struck by the apparent cock-sureness of Murphy, as manifested in those wonderful clinics of his. And yet the very simplicity of his diagnostic methods, so sane and yet so sure, excites still more our admiration, because his conclusions are so well grounded in correct pathology, aided by a remarkable medical perspective. He lays the greatest stress upon the anamnesis, whose analysis generally brings him to an incontrovertible conclusion. Two of the most readable and instructive essays of that prince of surgical writers, Moynihan, are those upon the "Pathology of the Living" and the "Inaugural Symptoms of Disease." In these he has developed more clearly his plea for the early diagnosis of disease. In none is its necessity more apparent than in the diseases of the upper half of the abdomen.

"The very great majority of medical writers, when dealing with the topic, "indigestion" or "dyspepsia," assert that in a

large proportion of such cases the symptom owes its origin to "functional" causes, and that it is not dependent upon any structural change in the abdominal organs. Again, it is said, when the question of cholelithiasis is considered, that only a very small number of those patients who carry stones in the gall-bladder suffer from troubles caused thereby. No one seems to have correlated the two statements or to have shown how the error in one is explained by the error in the other. The truth is that a very large number of patients—probably, indeed, a large majority—who have suffered for years from "gastric" disorders have no organic disease in the organ impugned, but have a real structural disease in other parts, notably the gall-bladder or the appendix. Nothing is more remarkable in connection with the surgical investigation of dyspepsia than the broadening of the organic bases upon which the clinical symptoms are found to be built. It is the stomach whose sensibilities are tender that cries out the warning when other organs are suffering attack."

He gives[3] a graphic description of the inaugural symptoms of cholelithiasis and says: "Such are the symptoms which may be present for months or even for years before a sudden and dramatic attack of acute pain, perhaps amounting to agony, occurs, as a result of the disarrangement of the stones, or of the attempt on the part of one stone to escape from the gall-bladder." The "harmless" gallstones are now making their presence unmistakable. But have they ever been harmless? In a paper entitled "Innocent Gallstones a Myth," W. G. Mayo says:

> **"Ten years ago we heard a great deal about 'innocent' gall-stones, which meant that gall-stones existed without symptoms and that their presence was not suspected until post-mortem examination brought them to light. We cannot now escape the conviction that the gall-stones did cause symptoms and that we, as diagnosticians, and not the gall-stones, were 'innocent'."**
>
> **"When the presence of stones in the gall-bladder has been recognized, what is the treatment to be adopted? There is, of course, no medical treatment of gall-stones. Nothing that can be wrought by drugs will have any effect in dissolving stones."**

All that can be done by medical treatment is to render the gallstones latent. Mayer believed that we could do this for years if we could prevent bile stagnation and infection. But this was the task of Sisyphus. Certain it is that most gall-

bladders, however symptomatically latent, suffer more or less pathologically, as shown by post-mortem examination. Moynihan remarks::

"I hold that when once a diagnosis of gall-stones has been made operation is always indicated, unless there are grave reasons forbidding resort to surgery. Reasons should not be asked to support a plea for operation, but to justify any other course than this."

This is the position surgeons assume, and this is the attitude the internist should adopt. There is demand or co-operation which is highly desirable in the interest, at least, of the patient.

Having made the diagnosis and decided upon operation, the question then is as to what procedure shall be adopted. I shall not run the risk of trying your patience further by speaking of the numerous incisions that have been recommended. Suffice it to say that any good incision, such as the straight incision, or the modifications, known as the Mayo-Robson, or the Bevan incision, calculated to give light and room for manipulation will do. Nor shall I, for lack of time, state the various conditions calling for cholecystostomy or cholecystectomy. The views of surgeons vary greatly. The statement of Moynihan may well be quoted:

"When, however, all the exceptions are considered, it may still be accepted as the readiest rule to remember at the moment of operation that a gall-bladder whose muscular power is unimpaired, whose cavity has suffered no appreciable diminuation, and whose duct is not obstructed, should be drained, and not removed."

The burden of proof is upon the surgeon to show why the gall-bladder may not be retained. We should alway bear in mind that the gall-bladder, unlike the appendix, is not a useless rudimentary organ, and should be preserved whenever it can be preserved as a useful organ. Moreover, its functional relation to the pancreas should not be forgotten. However, at the Mayo clinic ,where over 4,000 operations on the gall-apparatus have been done, probably 80% of gall-bladders are being now removed, but a reaction is apparent. W. G. Mayo stated to me recently that this was undoubtedly too large a percentage.

"As a matter of fact," he writes, "cholecystectomy is now largely indicated in gall-stone disease, and it may be said that practically all cases of cholecystitis and the large majority of cases of gall-stone disease should be treated by cholecystectomy rather than cholecystostomy."[4]

He has found that:

"chronic pancreatitis, the result of gall-stone disease, is usually cured by the removal of the stones and drainage of the biliary tract, and that in the chronic infections of the gall-bladder with secondary involvement of the pancreas, in the absence of interference with biliary drainage, cholecystectomy furnished a satisfactory symptomatic cure."*

One point I have inadvertently omitted to mention, namely, how are we to determine, with the abdomen open, whether the gall-bladder is pathogenic or not? Palpation and inspection will usually determine, a whitish or greyish gall-bladder that does not readily empty on compression being pathological, but occasionally both these signs mislead. Then palpation with the finger in the foramen of Winslow of the glands along the cystic and common ducts will settle the matter, because these glands drain the lymphatics of the gall-bladder, pancreas and upper part of duodenum.

Permit me to close this plea, inadequate it may be, for surgical intervention in gall-bladder disease with a quotation from the late, lamented Maurice Richardson, as repeated by John G. Clarke in a most valuable report on 160 gallstone cases.[5]

"Shall we wait for pathological changes of serious disease to become so characteristic that diagnosis is unmistakable? Shall the trend of medical and surgical thought be towards accuracy at the expense of safety? Shall the disease come to the surgeon or the surgeon to the disease? Shall the lesion prevail until the surgeon, perforce, strikes a blow, or shall the surgeon assault, overwhelm and destroy the lesion at its very inception? Shall we take that initiative, so important and favorable in matters of war, or shall we rest on the defensive?

"The answer is simple to me. With our utmost endeavor we must make an attack at the earliest possible moment, after we have with reasonable accuracy located the enemy and ascertained his resources."

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*Stanton, of Schenectady, holds that, if the gall-bladder is thoroughly emptied of foreign bodies and drained sufficiently long there would very rarely be recurrence, and the necessity for cholecystectomy would be less frequent.

DISCUSSION.

Dr. I. I. Lemann: I think with most internists that there are unquestioned evidences of gallstones, such as fever, colic and reflex gastric disturbances, that operative treatment is indicated. I do not know of any chemical solvent of gall stones. There is often great difficulty in interpreting the vague and reflex gastric disorders. I recall a case of this sort, a young lady who had dyspepsia, symptoms of hyperacidity, with attacks of pain in epigastrium and attacks of fever, also slight icterus. After six months observation a surgeon was called in and the gall bladder was opened and found to be normal, but the appendix was very long with abnormal contents. Following removal of the appendix relief was obtained. This illustrates the point of contention between the internist and surgeon. As another illustration I may cite the case of a member of my family who had a severe attack of what appeared to be gallstones, but never had any return. Cases like these show the field of medical treatment of gall-stones. The only medical treatment of gall-stones is that directed toward prophylaxis or prevention of infection of the gall bladder. I think these patients should be cautioned against errors of diet such as highly seasoned food, in other words such a diet as would be suggested in hyperclorhydria. I think surgeons are too prone to think that after the mechanical condition is removed the patient is cured. After surgical relief medical treatment is indicated.

Dr. Allan Eustis: This discussion is not complete without a few words on the subject of olive oil.

It is amazing how firmly the average layman and some physicians believe that olive oil will cause the passage of gall stones. This idea is very easily explained by an incident occurring in our clinic last winter. A young man had been having evident gallstone colic and was advised by a friend to drink copiously of olive oil. He brought to the clinic several objects which he had passed by the bowel, and which to the eye were certainly gallstones. They were fairly hard, had indented facets, and measured about ¼ of an inch in diameter. On analysis they consisted of 90% free fatty acid. The olive oil had been broken up by the lipase in the gastro-intestinal tract and in the absence of bile the insoluble palmitic and stearic acid had been molded by the peristaltic action of the intestines into these little balls.

It was with the greatest difficulty that I was able to persuade the patient that they were not gallstones which he had passed, but were the result of the olive oil ingested.

EXPERIMENTAL LIGATION OF THE SPLENIC ARTERIES IN DOGS.*

A PRELIMINARY REPORT.

By S. CHAILLE JAMISON, M. D., New Orleans.

In 1910 W. J. Mayo suggested ligation of the splenic artery, or of some of its branches, as a possible substitute for splenectomy, and stated that experimental ligation in dogs had been successful. He further stated, however, that it was necessary to leave the veins patent in order to avoid necrosis of the spleen; but, that if this were done, atrophy of the organ readily followed.

In December, 1914, I began some experiments along this line. During December and January ten dogs were operated upon. In these experiments the abdomen was opened through a left rectus incision, the spleen delivered, and the pedicle firmly ligated, both the veins and the arteries being included in the ligatures.

Two of these dogs died of shock and hemorrhage within a few hours; four of the dogs lived over one week and less than three; the remaining four lived over four months, in apparent perfect health, and were finally killed in the course of other experiments.

Of the four dogs which lived over a week and less than three, necrosis of the spleen was demonstrated at autopsy in three of them, and in the other, an enormous central abscess of the spleen was found. Cultures of the pus from this abscess failed to show a growth on Lœffler's blood serum or agar, and no organisms could be demonstrated in strained smears.

Of the dogs that survived (four in number), two were laparotomized some four months after the first operation and atrophied spleens removed. Both of these dogs recovered from the second operation without incident. One dog died five months after operation; in this case the spleen was atrophied, and no evidence could be found that its condition had contributed to death; the liver was found infected with coccidia and affected with advanced cirrhosis; Filarial worms were found in the heart; the latter probably produced the dog's death.

*Read before the Orleans Parish Medical Society, July 12, 1915. [Received for Publication August 11, 1915.—Eds.]

It is evident, then, that mere ligation of the splenic pedicle is extremely unsatisfactory, although successful in 50% of the cases, and that it would be entirely unjustifiable to subject a human patient to such a risk.

When, however, the operation was successful the result appeared to me so ideal that I felt justified in expending additional time and trouble in the search for a uniformly successful result.

Two dogs were experimented with late in January. The same steps were followed as above, except that large veins to the spleen were carefully isolated and not included in the ligatures. Both dogs died within ten days, and necrosis of the spleen was demonstrated at autopsy. This convinced me that patency of the veins did not hinder the necrosis.

In looking over the autopsy records and certain specimens that I had preserved from the foregoing experiments, I was impressed by the fact that where the dogs recovered the spleen was absolutely covered by the omentum, but that where the dogs developed necrosis of the spleen the omentum had apparently *failed to envelop it.* It was further observed that in one dog who survived three weeks after operation, the omentum had enveloped over half of the spleen, and that this part of the organ showed atrophy, while that part uncovered by omentum showed necrosis.

In the next experiments the abdomen was opened in the usual manner, and the splenic pedicle ligated, the arteries and veins being included in the ligatures, but the spleen was then *covered by the great omentum,* and the abdomen closed. Up to date five dogs have been treated in this manner and have recovered without incident. It was evident that in the our dogs that recovered from mere ligation of the pedicle, a severe crisis had been passed during the ten days following operation; this was not the case with the last five, who showed no evidence of any trouble more than would follow any simple laparotomy.

In those cases in which the spleen was covered by omentum, the degree of atrophy was greater than that following simple ligation, and came about in a shorter time—about three weeks, as well as could be determined.

These experiments are presented in the hope of helping other experimenters along these lines and to point out a way by which uniform results may be obtained, with the greatest degree of certainty, in putting the spleen out of function. My results, of course, need further confirmation and are not presented with any idea of applying them to the human at the present time.

DISCUSSION.

Dr. Lemann: I wish I were familiar enough with the subject to discuss it intelligently, because I do not think that any paper such as Dr. Jamison has presented to-night should pass without comment or discussion. We have relatively little original work presented to the Society, and when such a piece of work as Dr. Jamison has presented to-night does come before us, it is really a part of the recognition that should come to the author of the paper that he should have some discussion of it.

The problem is an exceedingly practical and important one. It is hard to know just what should be done with these large spleens. The results of splenectomy have not been such as to encourage the doctors to urge their patients to have it done, and if Dr. Jamison's researches hold out any further hope than we have had in the past, they will be of exceedingly great importance to those of us who have seen cases of splenomegalia.

Correspondence

BUREAU OF THE PUBLIC HEALTH SERVICE,
WASHINGTON, August 6, 1915.

EDITORS NEW ORLEANS MEDICAL AND SURGICAL JOURNAL,
New Orleans, La.

SIRS—Appearing in the August number of the NEW ORLEANS MEDICAL AND SURGICAL JOURNAL is an editorial entitled "Drinking Water on Railroad Trains," in which it is stated that "It is gratifying to see the initiative in one important phase directed at a proper water supply, undertaken by the utility itself, without formal procedure directing it," reference being made to efforts instituted by the Queen and Crescent Route to eliminate certain evils connected with the furnishing of drinking water for passengers.

May I invite your attention to the fact, without in any way detracting from the transportation line referred to, that formal procedure directing improvement in water supplies was instituted by this Bureau nearly three years ago, and applies to all lines engaged in interstate traffic.

On January 25, 1913, Amendment No. 6 to the Interstate Quarantine Regulations was promulgated by the Secretary of the Treasury. This amendment provides that water furnished by common carriers on cars, vessels, or vehicles, operated in interstate traffic for the use of passengers, shall be certified by the state or municipal health authority within whose jurisdiction it is obtained as incapable of conveying disease. Under the provisions of this amendment, the sources of water supply of all common carriers in the United States have been listed and semi-annual examinations required. Already over seven thousand such sources have been investigated, the work being performed in co-operation with the state and municipal health authorities, who deserve much credit for its success. Supplementing the order referred to, the Secretary of the Treasury

on October 21, 1914, promulgated a bacteriological standard for drinking water, to which all supplies must conform. The entire plan has resulted in the elimination of many unsafe waters, and while it has not been possible to examine all supplies in the short time the regulation has been in force, the traveling public is now assured that water furnished them for consumption is of proper quality.

The above facts are presented in order that you may understand that the movement for pure water supplies on common carriers is more extensive than your editorial indicates, and is largely the outcome of government action.

Respectfully,

(*Signed*) RUPERT BLUE,
Surgeon General.

N. O. Medical and Surgical Journal

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THE MEDICAL BROTHERHOOD.

"May not the medical sciences and medical men become again the standard bearers of morality, especially of international morals?"

This is the very kernel of an appeal to all men and all women engaged in the practice of medicine, urging them to band together to leaven the civilized world—meaning higher morality as it relates to mankind generally.

It is not superogatory at this time for the medical profession to think of its office as a means to a final peace on earth—for

its whole purpose, analyzed to end results, is good will to all men. In times of peace, even amid the unrest occasioned by the political and commercial world activities, the medical profession has chiefly occupied itself in working for a better race. Hygiene and preventive medicine on their present plane have come from the effort of the scientists and field workers among medical men. Disease problems, epidemics and their remedies, the school betterment, are a part only of the division of labor of this group of scientific men and women.

The guild of apothecaries and of pioneer surgeons aimed rather at co-operation in trade; associations of medical men to-day have higher objectives.

It is not, then, unreasonable for medical men and women to band together in a world-wide fraternity with the chief purpose of creating the spirit of tolerance and brotherhood among all mankind.

The idea is thoroughly altruistic and perhaps, just now, visionary, but some dreams come true, and particularly if they are signals of effort to make them realities. At any rate, it can only bring about good in the profession itself to organize for universal morality, and when the honor of the world comes back, and when the mechanism of fearful war shall have exhausted itself, it may be well for the medical profession to show this ready source of solace, comfort and a hand of succor to those who are derelicts of the great struggle.

More than this, the very labor of the men at the front will stimulate the medical men in the remote corners to work for another glory at home, and when the final roll is called perhaps the guild of the *"fraternitas medicorum"* may have earned a place among the elect.

TULANE TEACHERS.

The dismissal, recently, of a professor in the School of Medicine of Tulane by the Board of Administrators of the University has given rise to some discussion among the profession, not only because there is always more than one viewpoint on any question, but especially because of the extensive notice given by the daily press to the occurrence.

While the editors of the JOURNAL are members of the teach-

ing staff of Tulane, this is in no way an inspired article. It merely tries in a fair way to reflect the concensus of opinion in the medical profession of New Orleans. As is to be expected, there are some few who seize upon the occasion as a not-to-be-neglected opportunity to find more or less bitter fault with the teaching methods of the College of Medicine, with the personnel of the faculties, with the policies of the Board. The champions of Tulane, more numerous, are outspoken in their defense, many going to the extreme of saying that it is the business of the University alone.

To the impartial and unbiased there are two angles from which to view the question: the legal and the moral. Little need be said on the legal point. All professors are elected at the pleasure of the Board; again, the matter is very likely to be settled in the courts and, besides, it can only be a matter of some dollars. The moral side is the all important one. If the Board's action was based on the desire to throttle free speech or crush frank criticism, no outcry against it could be too loud or emphatic. Universities, of all institutions, should foster liberal ideas, invite advice as well as give it, accept suggestions as well as offer them. The Board of Tulane has always seemed to accept these self-evident propositions. What, then, was the reason for the dismissal? It was the ill-timed, ill-mannered, inimical and public outburst of fault-finding with most of the departments and many of the individual teachers of a school with which the accuser was connected, showing on his part a deplorable lack of harmony and **esprit du corps.** Team-work, so loudly lauded by him, had become impossible with him a member of the faculty—the logical action was to drop him. There is no need to go into contributory issues.

The report of the committee, to whom the matter was referred for investigation, is very full, as it includes both the charges of the dismissed one and the statements of the faculty in rebuttal. Unfortunately from its very fulness, it is exceedingly lengthy, and we fear that comparatively few have had the patience or the time to give it a close and complete reading.

This report was handed in unanimously by the committee and was adopted unanimously by the Board. A careful consid-

eration thereof forces the conclusion that not only was the Board justified in severing the connection between the harsh and dissension-provoking critic of his faculty and his Board and those colleagues themselves, but such action was imperative in the interest of the School of Medicine and the University.

The fact that part of the criticism had some foundation does not alter the principles of the case.

GENIUS PASSES.

On August 20 last, two contemporary scientists passed away, Paul Ehrlich and Carlos J. Finlay. The one was a great factor in the development of laboratory methods of bacteriologic investigation for nearly a quarter of a century and both were pre-eminent in the achievement of preventive medicine. Ehrlich's name is best known in connection with Salvarsan, but in diphtheria, studies of the blood, and in biochemistry he was a great pioneer.

Carlos Finlay's death comes to us more acutely because of his relation to the discovery of the cause of yellow fever, and even though he was eighty-two years old at his passing, he will be missed.

Both men will leave their names as monuments to the science of today and will be remembered for their accomplished tasks.

Medical News Items

MEETING OF OBSTETRICIANS AND GYNECOLOGISTS.—The American Association of Obstetricians and Gynecologists will hold its twenty-eighth annual meeting at the Hotel Schenley, Pittsburg, September 14-16, under the presidency of Dr. Charles L. Bonifield, Cincinnati. An attractive program has been prepared and a full meeting is expected.

MEETING OF EYE, EAR, NOSE AND THROAT SPECIALISTS.—The American Academy of Ophthalmology and Oto-Laryngology will hold its twentieth annual meeting in Chicago, October 5-7, under the presidency of Dr. Joseph C. Beck. Clinics will be held at the various Chicago hospitals on the day before the meeting and the two days following, where members are

expected and will be welcome. The headquarters will be at the Hotel Sherman.

TRI-STATE SOCIETY MEETING.—The Tri-State Medical Society of Arkansas, Louisiana and Texas will hold its annual meeting at Marshall, Texas, December 14 and 15. Three medals will be awarded at this meeting for the three best essays on original work done throughout that year. The contest is limited to physicians residing in Arkansas, Louisiana and Texas. For further particulars, apply to Dr. Jacob Bodenheimer, secretary-treasurer, Shreveport, La.

MEETING OF MISSOURI VALLEY PHYSICIANS.—The twenty-eighth annual meeting of the Medical Society of the Missouri Valley will be held in Des Moines, Iowa, September 23 and 24, under the presidency of Dr. Granville N. Ryan, Des Moines.

EIGHTH DISTRICT MEDICAL SOCIETY OF LOUISIANA.—The Eighth District Medical Society, with prominent members from all the parishes in the district, met in the Rapides Parish Court House on July 30. There were prominent physicians from Rapides, Natchitoches, Avoyelles, Sabine, Vernon and Winn parishes present, and also several prominent men from other parishes of the State of Louisiana. Pellagra was among the live topics discussed at the meeting, the speakers dwelling upon the character of the disease and mode of transmission and treatment. In the discussion, it seemed to be the concensus of opinion that pellagra is an infectious disease, being transmitted through blood-sucking insects, the flea and bedbug being especially condemned. The next meeting of the Society will be held in Natchitoches on the last Thursday in October.

THE AMERICAN PROCTOLOGIC SOCIETY held its seventeenth annual meeting at San Jose, California, June 21-22, and elected the following officers: Dr. T. Chittenden Hill, Boston, Mass., president; Dr. Frank C. Yeomans, New York City, vice-president; Dr. Alfred J. Zobel, San Francisco, Cal., secretary-treasurer; and Drs. Louis J. Krouse, Cincinnati, Ohio, Dr. T. Chittenden Hill, Dr. Geo. B. Evans, Dayton, Ohio, and Dr. Alfred J. Zobel, executive council.

RED CROSS PHYSICIANS AND NURSES MUST BE RECALLED.—It is announced that on account of exhaustion of the general fund which aggregated $1,565,000, the American Red Cross will have to withdraw its various physicians and nurses from European

battlefields on October 1. Of the 367 persons engaged in humanitarian enterprise, which the Red Cross has sent to the war zone, 71 were surgeons and 253 nurses, while 43 were members of the Serbian sanitary commission.

MEDICAL FELLOWSHIP FOR HARVARD.—An annual income of about $800 from a fund donated by Mr. Douglas Flattery, of Boston, has been presented to Harvard Medical School for the encouragement of the scientific study of the cause and prevention of disease.

WISCONSIN LOSES CHIROPRACTIC BILL.—According to report, the senate committee of Wisconsin turned down the bill which proposed to license chiropractors. It was the opinion of the committee that in its opinion this new school of practice was not entitled to recognition under the laws of the state.

DECREASE IN TUBERCULAR DEATH RATE.—According to George M. Cooper, of Washington, the tubercular death rate has decreased from 326 : 100,000 population in 1880 to 146.6 in 1913.

RELIEF FUND FOR THE BELGIAN PROFESSION.—The Report of the Treasurer, Dr. F. F. Simpson, of the committee of the American physicians for the aid of the Belgian profession, shows, for the week ending August, 1915, a total disbursement of $7,310.04 and a balance on hand of $469.80. The total receipts are $7,779.84.

POST-GRADUATE MEDICAL SCHOOL TO REOPEN.—The New Orleans Post-Graduate School of Medicine will begin its second year as an affiliated institution of Loyola University. The arrangements are under approbation of the Jesuit Order of Rome, and the formal announcement of the date of the opening will soon be made. The board of directors of the school is made up of Drs. Homer Dupuy, president; William Kohlman, vice-president; Joseph A. Danna, secretary; Oscar Dowling, A. Nelken, C. G. Cole, Joseph M. Elliot, O. L. Pothier and T. J. Dimitry. It was reported that the school would organize an under-graduate medical department as part of Loyola University, but this has been denied by the authorities.

KANSAS CITY'S PURE MILK ORDINANCE.—An example of what can be done by a health board that is divorced from politics is shown in the work of the Health Department of Kansas City. Largely due to the persistent efforts of the Consumers' League,

aided by Dr. Paul Paquin's able direction, the new pure milk ordinance has gone into effect, and the quacks are gradually disappearing under the hot fire that is being levelled against them.

Baby Without Hands and Feet.—Tallapoosa, Georgia, has a case of a baby boy recently born without hands and feet. The baby lives and is six months old—an unusually bright, fat, healthy baby. Dr. W. H. Malone, of Tallapoosa, Georgia, writes in the July issue of the *Medical World,* in discussing the case: "I wish to state in this connection that I believe strongly in 'maternal impression.' Upon inquiry into this case, I found that the mother had seen a show about eleven months prior to birth of the baby. There was in the show a curiosity man, who had no upper extremities, and only one lower extremity with which he sewed and performed various stunts. I believe she reflected back to this event, or probably saw his picture, or it was discussed in her presence during early pregnancy."

Greased Tulle for Wounds in the French Army.—Dr. M. A. Lumiere, of Lyons, has discovered that the use of compresses of tulle with mesh of 2 mm., separated from each other by paper and sterilized by heat for an hour in a mixture of petroleum, wax, castor oil and balsam of Peru, will prevent the adhering to wounds while the secretions pass through the mashes of the tulle and are absorbed by the wadding of the dressings. This is a distinct advantage over the sterilized gauze dressings, which adhere to the wounds and are difficult to detach.

Test to Determine Sex.—A unique test has been proposed by Dr. Geo. Starr White, of Los Angeles, for determining the sex of the unborn child. The doctor places the prospective mother on a plate of aluminum with her face to the north. If her right finger points at you, it will be a girl; if the left hand happens to go up, it will be a boy. What would happen if both hands went up, or if the woman happened to be left-handed, is not provided for in Dr. White's test.

Local Option Favored by Physicians.—Over 700 physicians of Philadelphia, men and women, signed petitions to the legislature asking the passage of the local option bill.

Baby Hospital for Serbia.—A baby hospital, to be supported by the American Red Cross and to be carried on by American

doctors and nurses, is being established in Serbia. The hospital will be called the Mabel Grouitch Baby Hospital, in recognition of the Red Cross activities of Mme. Slavko Grouitch, wife of the Serbian Under-Secretary for Foreign Affairs, who is an American woman. Drs. Louise Taylor Jones, of Washington, and Catherine H. Travis, of New Britain, Conn., will have charge of the hospital.

RESIGNATION OF DR. MAYER FROM STAFF OF "CENTRALBLATT FUR LARYNGOLOGIE."—Dr. Emil Mayer, of New York City, who for the past sixteen years has been collaborator for America, tendered his resignation to the editor of *Centralblatt* because of the recent action of the editor and publisher of that journal in removing the name of Sir Felix Simon from the title page because of his expression of opinion as a naturalized English citizen regarding "Germany's barbarous warfare." As this action destroyed the journal's claim to be international in character, Dr. Mayer's resignation came as a protest against the introduction of politics in a scientific journal and in loyalty to a man who has done so much for laryngology.

WAR DEMONSTRATES POSITION OF MEDICAL SCIENCES AND PRACTICE.—One of the encouraging facts among the many certain sad facts of the present horrible war is that among all the sciences and professions the medical sciences and medical practice occupy an almost unique relationship to warfare, and that, among all the citizens of a country at war, medical men and women occupy a peculiar and distinctive position, says the appeal of the "Medical Brotherhood for the Furtherance of International Morality," which has recently been sent out to the "men and women engaged in medical practice and the advancement of the medical sciences." This appeal is published in full in the *Medical Record,* New York City.

PERSONALS.—Sister Regina Kenny, who for forty years had been in executive charge of hospitals, and for the last ten years sister superior of the Mobile Hospital, died on July 15.

Dr. Francis X. Mahoney has been appointed health commissioner of Boston. This action was taken by the mayor after consultation with Surgeon Richard H. Creel, U. S. P. H. S., who found that it would be impossible for him to accept the position.

Dr. C. D. Simmons was recently appointed physician and surgeon for the A. & M. College at Stillwater, Oklahoma. Dr. Simmons is a native of Baton Rouge, and graduated at the Louisville, Kentucky, Medical College, doing post-graduate work at Tulane University, New Orleans, New York City and Kansas City, Mo. He was a member o the Louisiana State Medical Examining Board, of which he became vice-president, and resigned to go to Oklahoma.

Dr. C. Borne, sanitarian and health officer from the Netherlands, visited New Orleans during the month. Dr. Borne is connected with public health service of the royal government of Holland and is making a tour of the larger cities of the United States, studying health and sanitary problems.

Dr. Clarence Pierson, of Pineville, La., paid a brief visit to New Orleans during the month.

REMOVALS.—Dr. P. J. Miller, from Carencro to Abbeville, La.

DIED.—On July 31, 1915, at Covington, Va., Dr. Wilbur Boswell Payne. Though a Virginian, Dr. Payne received his medical education at Tulane University and was well known in this city.

On August 7, 1915, Dr. Moses Blake, of Olla, La., aged 25 years.

Publications Received

F. A. DAVIS & COMPANY. Philadelphia and London, 1915.

Essentials of Laboratory Diagnosis, by Francis Ashley Faught, M. D. Fifth edition.

W. B. SAUNDERS & COMPANY. Philadelphia and London, 1915.

Diarrheal, Inflammatory, Obstructive and Parasitic Diseases of the Gastro-Intestinal Tract, by Samuel Goodwin Gant, M. D., LL. D.

The Treatment of Fractures, by Chas. Locke Scudder, M. D. Eighth edition.

The American Pocket Medical Dictionary, edited by W. A. Dorland, A. M., M. D., F. A. C. S. Ninth edition, revised and enlarged.

A Manual of Personal Hygiene, edited by Walter L. Pyle, A. M., M. D. Sixth edition, revised and enlarged.

Operative Gynecology, by Harry Sturgeon Crossen, M. D., F. A. C. S.

Collected Papers of the Mayo Clinic, Rochester, Minn., edited by Mrs. M. H. Mellish. Volume V, 1914.

The Clinics of John B. Murphy at Mercy Hospital, Chicago. June, 1915.

The Medical Clinics of Chicago. Volume 1, No. 1. July, 1915.

LEA & FEBIGER. Philadelphia and New York.

Chemistry and Chemical Urinalysis for Nurses, by Harold L. Amoss, S. B., S. M., M. D., DR. P. H.

Cancer: Its Study and Prevention, by Howard Cannong Taylor, M. D.

P. BLAKISTON'S SON & COMPANY. Philadelphia, 1915.

The Development of the Human Body, by J. Playfair McMurrich, A. M., Ph.D., LL.D. Fifth edition, revised and enlarged.

The Ductless Glandular Diseases, by Wilhelm Falta. Translated and edited by Milton K. Meyers, M. D., with a foreword by Archibald E. Garrod, M. D., F. R. C. P., F. R. S.

A Compend of Medical Chemistry, by Henry Leffmann, A. M., M. D.

THE YEAR BOOK PUBLISHERS. Chicago, 1915.

The Practical Medicine Series. Volume IV: **Gynecology,** edited by Emilius C. Dudley, A. M., M. D., and Herbert M. Stowe, M. D.

WASHINGTON GOVERNMENT PRINTING OFFICE. Washington, D. C., 1915.

Public Health Reports. Volume 30, Nos. 27, 28, 29, 30.

Report of the Department of Health of the Panama Canal for the Month of May, 1915.

Typhoid Fever, by Paul Preble.

Reprints

Mistakes in Urinary Diagnosis; The Frequent Error of Mistaking Indican and Other Reducing Substances for Grape Sugar, by Theodore William Schaefer, M. D.

Some Facts Pertaining to the Wassermann Reaction in Relation to Diagnosis and Treatment, by R. B. H. Gradwohl, M. D.

Notes on Michigan Liliaceæ, by Oliver Atkins Farwell.

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans for July, 1915.

Cause.	White	Colored	Total
Typhoid Fever	6	.....	6
Intermittent Fever (Malarial Cachexia)	3	2	5
Smallpox	.....	.....	.....
Measles	.....	.....	.....
Scarlet Fever	.....	.....	.....
Whooping Cough	1	.....	1
Diphtheria and Croup	3	1	4
Influena	1	.....	1
Cholera Nostras	.....	.....	.....
Pyemia and Septicemia	2	1	3
Tuberculosis	26	58	84
Cancer	19	10	29
Rheumatism and Gout	.....	1	1
Diabetes	3	.....	3
Alcoholism	1	.....	1
Encephalitis and Meningitis	3	1	4
Locomotor Ataxia	1	.....	1
Congestion, Hemorrhage and Softening of Brain	23	15	38
Paralysis	4	.....	4
Convulsions of Infancy	.....	.....	.....
Other Diseases of Infancy	23	7	30
Tetanus	.....	1	1
Other Nervous Diseases	7	3	10
Heart Diseases	34	36	70
Bronchitis	3	4	7
Pneumonia and Broncho-Pneumonia	12	17	29
Other Respiratory Diseases	4	1	5
Ulcer of Stomach	1	3	4
Other Diseases of the Stomach	3	3	6
Diarrhea, Dysentery and Enteritis	16	9	25
Hernia, Intestinal Obstruction	1	.....	1
Cirrhosis of Liver	2	6	8
Other Diseases of the Liver	1	2	3
Simple Peritonitis	.....	.....	.....
Appendicitis	5	2	7
Bright's Disease	26	13	39
Other Genito-Urinary Diseases	21	12	33
Puerperal Diseases	3	5	8
Senile Debility	2	1	3
Suicide	6	.....	6
Injuries	24	29	53
All Other Causes	20	17	37
Total	316	264	580

Still-born Children—White, 23; colored, 27. Total, 50.

Population of City (estimated)—White, 272,000; colored, 101,000. Total, 373,000.

Death Rate per 1,000 per Annum for Month—White, 13.94; colored, 31.37. Total, 18.66. Non-residents excluded, 16.25.

METEOROLOGIC SUMMARY (U. S. Weather Bureau).

Mean atmospheric pressure 29.99
Mean temperature ..... 85.
Total precipitation ..... 7.55 inches
Prevailing direction of wind, southwest.